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Federal Seed Act Regulations Part 201

**Interstate Commerce, and
General Regulations**

Seed Testing Regulations

Certified Seed Regulations

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FEDERAL SEED ACT

PART 201—FEDERAL SEED ACT REGULATIONS

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RULES AND REGULATIONS OF THE SECRETARY OF AGRICULTURE

DEFINITIONS

§ 201.1 Meaning of words.

Words in the regulations in this part in the singular form shall be deemed to import the plural, and vice versa, as the case may demand.

[5 FR 28, Jan. 4, 1940]

§ 201.2 Terms defined.

When used in the regulations in this part the terms as defined in section 101 of the act, unless modified in this section as provided in the act, shall apply with equal force and effect. In addition, as used in §§ 201.1 through 201.159:

(a) *The act.* The term "act" means the Federal Seed Act, approved August 9, 1939 (53 Stat. 1275; 7 U.S.C. 1551-1610 as amended);

(b) *Person.* The term "person" includes a partnership, corporation, company, society, association, receiver, or trustee;

(c) *Secretary.* The term "Secretary" means the Secretary of Agriculture of the United States, or any officer or employee of the Department to whom authority has heretofore been delegated, or to whom authority may hereafter be delegated, to act in his stead.

(d) *Hearing Clerk.* The term "Hearing Clerk" means the Hearing Clerk, United States Department of Agriculture, Washington, D.C.;

(e) *Respondent.* The term "respondent" means a person against whom a complaint is issued;

(f) *Examiner.* The term "examiner" means an employee of the Department of Agriculture, designated by the Secretary to conduct hearings under the act, and §§ 201.1 through 201.159;

(g) *FEDERAL REGISTER.* The term "FEDERAL REGISTER" means the publication provided by the Act of July 26, 1935 (49 Stat. 500), and acts supplementary thereto and amendatory thereof;

(h) *Agricultural seeds.* The term "agricultural seeds" means the following kinds of grass, forage, and field crop seeds, which are used for seeding purposes in the United States:

Agrotricum—*X Agrotriticum* Ciferri and Giacom.
Alfalfa—*Medicago sativa* L.
Alfilaria—*Erodium cicutarium* (L.) L'Her.
Alyceclover—*Alysicarpus vaginalis* (L.) DC.
Bahiagrass—*Paspalum notatum* Fluegge.
Barrelclover—*Medicago truncatula* Gaertn.
Barley—*Hordeum vulgare* L.
Bean, adzuki—*Vigna angularis* (Willd.) Ohwi and Ohashi.
Bean, field—*Phaseolus vulgaris* L.
Bean, mung—*Vigna radiata* (L.) Wilczek.
Bean—(see Velvetbean).
Beet, field—*Beta vulgaris* L.
Beet, sugar—*Beta vulgaris* L.
Beggarweed—*Desmodium tortuosum* (Sw.) DC.
Bentgrass, colonial—*Agrostis tenuis* Sibth.
Bentgrass, creeping—*Agrostis stolonifera* var. *palustris* (Huds.) Farw.
Bentgrass, velvet—*Agrostis canina* L.
Bermudagrass—*Cynodon dactylon* (L.) Pers. var. *dactylon*.
Bermudagrass, giant—*Cynodon dactylon* var. *aridus* Harlan et de Wet.
Bluegrass, bulbous—*Poa bulbosa* L.
Bluegrass, Canada—*Poa compressa* L.
Bluegrass, glaucantha—*Poa glaucantha* Gaud.
Bluegrass, Kentucky—*Poa pratensis* L.
Bluegrass, Nevada—*Poa nevadensis* Vasey.
Bluegrass, rough—*Poa trivialis* L.
Bluegrass, Texas—*Poa arachnifera* Torr.
Bluegrass, wood—*Poa nemoralis* L.
Bluestem, big—*Andropogon gerardii* Vitt.
Bluestem, little—*Schizachyrium scoparium* (Michx.) Nash (*Andropogon scoparius* Michx.).
Bluestem, sand—*Andropogon hallii* Hack.
Bluestem, yellow—*Bothriochloa ischaemum* (L.) Keng.
Brome, field—*Bromus arvensis* L.
Brome, meadow—*Bromus biebersteinii* Roem. and Schult.
Brome, mountain—*Bromus marginatus* Nees.
Brome, smooth—*Bromus inermis* Leyss.
Broomcorn—*Sorghum bicolor* (L.) Moench.
Buckwheat—*Fagopyrum esculentum* Moench (F. *vulgare* Hill.).
Buffalograss—*Buchloe dactyloides* (Nutt.) Engl.
Buffelgrass—*Cenchrus ciliaris* L. (*Pennisetum ciliare* (L.) Link.).
Burclover, California—*Medicago polymorpha* L.
Burclover, spotted—*Medicago arabica* (L.) DC.
Burnet, little—*Sanguisorba minor* Scop.
Buttonclover—*Medicago orbicularis* (L.) All.
Canarygrass—*Phalaris canariensis* L.
Canarygrass, reed—*Phalaris arundinacea* L.
Carpetgrass—*Axonopus affinis* Chase.
Castorbean—*Ricinus communis* (L.).
Chess, soft—*Bromus mollis* L.
Chickpea—*Cicer arietinum* L.
Clover, alsike—*Trifolium hybridum* L.
Clover, arrowleaf—*Trifolium vesiculosum* Savi.
Clover, berseem—*Trifolium alexandrinum* L.
Clover, cluster—*Trifolium glomeratum* L.
Clover, crimson—*Trifolium incarnatum* L.

Clover, Kenya—*Trifolium semipilosum* Fren.
Clover, ladino—*Trifolium repens* L.
Clover, lappa—*Trifolium lappaceum* L.
Clover, large hop—*Trifolium campestre* Schreb.
Clover, Persian—*Trifolium resupinatum* L.
Clover, red or
 Red clover, mammoth—*Trifolium pratense* L.
 Red clover, medium—*Trifolium pratense* L.
Clover, rose—*Trifolium hirtum* All.
Clover, small hop (suckling)—*Trifolium dubium* Sibth.
Clover, strawberry—*Trifolium fragiferum* L.
Clover, sub (subterranean)—*Trifolium subterraneum* L.
Clover, white—*Trifolium repens* L. (also see Clover, ladino).
Clover, (also see Alyceclover, Bur-clover, Buttonclover, Sourclover, Sweetclover).
Corn, field—*Zea mays* L.
Corn, pop—*Zea mays* L.
Cotton—*Gossypium* spp.
Cowpea—*Vigna unguiculata* (L.) Walpers subsp. *unguiculata*;
Crambe—*Crambe abyssinica* Hochst. ex R.E. Fries.
Crested dogtail—*Cynosurus cristatus* L.
Crotalaria, lance—*Crotalaria lanceolata* E. Mey.
Crotalaria, showy—*Crotalaria spectabilis* Roth.
Crotalaria, slenderleaf—*Crotalaria brevidens* Benth. var. *intermedia* (Kotschy) Polhill.
Crotalaria, striped—*Crotalaria pallida* Ait.
Crotalaria, Sunn—*Crotalaria juncea* L.
Crownvetch—*Coronilla varia* L.
Dallisgrass—*Paspalum dilatatum* Poir.
Dichondra—*Dichondra repens* Forst.
Dropseed, sand—*Sporobolus cryptandrus* (Torr.) A. Gray.
Emmer—*Triticum dicoccum* Schrank.
Fescue, Chewings—*Festuca rubra* L. subsp. *commutata* Gaudin.
Fescue, hair—*Festuca tenuifolia* Sibth.
Fescue, hard—*Festuca longifolia* Thuill.
Fescue, meadow—*Festuca pratensis* Huds.
Fescue, red—*Festuca rubra* L. subsp. *rubra*.
Fescue, sheep—*Festuca ovina* L. var. *ovina*.
Fescue, tall—*Festuca arundinacea* Shreb.
Flax—*Linum usitatissimum* L.
Grama, blue—*Bouteloua gracilis* (H. B. K.) Lag.
Grama, side-oats—*Bouteloua curtipendula* (Michx.) Torr.
Guar—*Cyamopsis tetragonoloba* (L.) Taub.
Guineagrass—*Panicum maximum* Jacq.
Hardinggrass—*Phalaris stenoptera* Hack.
Hemp—*Cannabis sativa* L.
Indiangrass, yellow—*Sorghastrum nutans* (L.) Nash.
Indigo, hairy—*Indigofera hirsuta* L.
Japanese lawngrass—*Zoysia japonica* Steud.
Johnsongrass—*Sorghum halepense* (L.) Pers.
Kudzu—*Pueraria lobata* (Willd.) Ohwi.
Lentil—*Lens culinaris* Medic.
Lespedeza, Korean—*Lespedeza stipulacea* Maxim.
Lespedeza, sericea or Chinese—*Lespedeza cuneata* (Dumont) D. Don. [L. *sericea* (Thunb.) Miq.]
Lespedeza, Siberian—*Lespedeza juncea* (L. f.) Pers.
Lespedeza, straite—*Lespedeza striata* (Thunb.) Hook and Arn.
Lovegrass, sand—*Eragrostis trichodes* (Nutt.) Wood.
Lovegrass, weeping—*Eragrostis curvula* (Schrad.) Nees.
Lupine, blue—*Lupinus angustifolius* L.
Lupine, white—*Lupinus albus* L.

Lupine, yellow— <i>Lupinus luteus</i> L.	Velvetbean— <i>Mucuna deeringiana</i> (Bort.) Merr.	Chives— <i>Allium schoenoprasum</i> L.
Manilagrass— <i>Zoysia matrella</i> (L.) Merr.	Velvetgrass— <i>Holcus lanatus</i> L.	Citron— <i>Citrullus lanatus</i> (Thunb.) Matsum. and Nakai var. <i>citroides</i> (Bailey) Mansf.
Meadow foxtail— <i>Alopecurus pratensis</i> L.	Vetch, common— <i>Vicia sativa</i> L. subsp. <i>sativa</i> .	Collards— <i>Brassica oleracea</i> var. <i>acephala</i> DC.
Medick, black— <i>Medicago lupulina</i> L.	Vetch, hairy— <i>Vicia villosa</i> Roth.	Corn, sweet— <i>Zea mays</i> L.
Milkvetch— <i>Astragalus cicer</i> L.	Vetch, Hungarian— <i>Vicia pannonica</i> Gratz.	Cornsalad— <i>Valerianella locusta</i> (L.) Lateralrade.
Millet, browntop— <i>Brachiaria ramosa</i> (L.) Stapf.	Vetch, monantha— <i>Vicia articulata</i> Hornem. (V. <i>monantha</i> Desf.)	Cowpea— <i>Vigna unguiculata</i> (L.) Walpers subsp. <i>unguiculata</i> .
Millet, foxtail— <i>Setaria italica</i> (L.) Beauv.	Vetch, narrowleaf— <i>Vicia sativa</i> subsp. <i>nigra</i> (L.) Ehrh.	Cress, garden— <i>Lepidium sativum</i> L.
Millet, Japanese— <i>Echinochloa crusgalli</i> var. <i>frumentacea</i> (Roxb.) Wight.	Vetch, purple— <i>Vicia benghalensis</i> L.	Cress, upland— <i>Barbarea verna</i> (Mill.) Aschers.
Millet, pearl— <i>Pennisetum americanum</i> (L.) K. Schum.	Vetch, woollypod— <i>Vicia villosa</i> subsp. <i>varia</i> (Host) Corb.	Cress, water— <i>Nasturtium officinale</i> R. Br.
Millet, proso— <i>Panicum miliaceum</i> L.	Wheat, common— <i>Triticum aestivum</i> L. (<i>T. vulgare</i> Vill.)	Cucumber— <i>Cucumis sativus</i> L.
Molassesgrass— <i>Melinis minutiflora</i> Beauv.	Wheat, club— <i>Triticum compactum</i> Host.	Dandelion— <i>Taraxacum officinale</i> Weber.
Mustard, black— <i>Brassica nigra</i> Koch.	Wheat, durum— <i>Triticum durum</i> Desf.	Eggplant— <i>Solanum melongena</i> (L.).
Mustard, India— <i>Brassica juncea</i> (L.) Coss.	Wheat, Polish— <i>Triticum polonicum</i> L.	Endive— <i>Cichorium endivia</i> L.
Mustard, white— <i>Sinapis alba</i> L.	Wheat, poulard— <i>Triticum turgidum</i> L.	Gherkin, West India— <i>Cucumis anguria</i> L.
Napiergrass— <i>Pennisetum purpureum</i> Schumach.	Wheat X Agrotricum— <i>Triticum X Agrotriticum</i> .	Kale— <i>Brassica oleracea</i> var. <i>acephala</i> DC.
Oat— <i>Avena byzantina</i> Koch., <i>A. sativa</i> L., <i>A. nuda</i> L.	Wheatgrass, beardless— <i>Agropyron spicatum</i> (Pursh) Scribner & Smith f. <i>inerme</i> (Scribner & Smith) Beetle.	Kale, Chinese— <i>Brassica oleracea</i> var. <i>alboglabra</i> (Bailey) Musil.
Oatgrass, tall— <i>Arrhenatherum elatius</i> (L.) Mert. and Koch.	Wheatgrass, crested or fairway crested— <i>Agropyron cristatum</i> (L.) Gaertn.	Kale, Siberian— <i>Brassica napus</i> var. <i>pabularia</i> (DC) Reichb.
Orchardgrass— <i>Dactylis glomerata</i> L.	Wheatgrass, crested or standard crested— <i>Agropyron desertorum</i> (Fisch.) Schult.	Kohlrabi— <i>Brassica oleracea</i> var. <i>gongylodes</i> L.
Panicgrass, blue— <i>Panicum antidotale</i> Retz.	Wheatgrass, intermediate— <i>Agropyron intermedium</i> (Host) Beauv.	Leek— <i>Allium ampeloprasum</i> L.
Panicgrass, green— <i>Panicum maximum</i> var. <i>trichoglume</i> Eyles.	Wheatgrass, pubescent— <i>Agropyron intermedium</i> (Host) Beauvois var. <i>trichophorum</i> (Link) Halacsy.	Lettuce— <i>Lactuca sativa</i> L.
Peanut— <i>Arachis hypogaea</i> L.	Wheatgrass, Siberian— <i>Agropyron sibiricum</i> (Willd.) Beauv.	Muskmelon— <i>Cucumis melo</i> L.
Pea, field— <i>Pisum sativum</i> var. <i>arvense</i> (L.) Poir.	Wheatgrass, slender— <i>Agropyron trachycaulum</i> (Link) Malte ex H. F. Lewis.	Mustard, India— <i>Brassica juncea</i> (L.) Coss.
Poa trivalis—(see Bluegrass, rough).	Wheatgrass, streambank— <i>Agropyron riparium</i> Scribn. and Smith.	Mustard, spinach— <i>Brassica perviridis</i> Bailey.
Rape, annual— <i>Brassica napus</i> var. <i>annua</i> Koch.	Wheatgrass, tall— <i>Agropyron elongatum</i> (Host) Beauv.	Okra— <i>Abelmoschus esculentus</i> (L.) Moench.
Rape, bird— <i>Brassica rapa</i> L.	Wheatgrass, western— <i>Agropyron smithii</i> Rydb.	Onion— <i>Allium cepa</i> L.
Rape, turnip— <i>Brassica rapa</i> L.	Wild-rye, Canada— <i>Elymus canadensis</i> L.	Onion, Welsh— <i>Allium fistulosum</i> L.
Rape, winter— <i>Brassica napus</i> var. <i>biennis</i> (Schubl. and Mart.) Reichb.	Wild-rye, Russian— <i>Elymus junceus</i> Fisch.	Pak-choi— <i>Brassica chinensis</i> L.
Redtop— <i>Agrostis gigantea</i> Roth.	Zoysia japonica—(see Japanese lawnglass)	Parsley— <i>Petroselinum crispum</i> (Mill.) A. W. Hill.
Rescuegrass— <i>Bromus unioloides</i> Kunth.	Zoysia matrella—(see Manila grass)	Parsnip— <i>Pastinaca sativa</i> L.
Rhodesgrass— <i>Chloris gayana</i> Kunth.	(i) <i>Vegetable seeds.</i> The term “vegetable seeds” means the seeds of the following kinds that are or may be grown in gardens or on truck farms and are or may be generally known and sold under the name of vegetable seeds:	Pea— <i>Pisum sativum</i> L.
Rice— <i>Oryza sativa</i> L.	Artichoke— <i>Cynara scolymus</i> L.	Pepper— <i>Capsicum</i> spp.
Ricegrass, Indian— <i>Oryzopsis hymenoides</i> (Roem. and Schult.) Ricker.	Asparagus— <i>Asparagus officinalis</i> L.	Pumpkin— <i>Cucurbita pepo</i> L., <i>C. moschata</i> Duchesne and <i>C. maxima</i> Duchesne.
Roughpea— <i>Lathyrus hirsutus</i> L.	Asparagusbean— <i>Vigna unguiculata</i> (L.) Walp. subsp. <i>sesquipedalis</i> (L.) Verde.	Radish— <i>Raphanus sativus</i> L.
Rye— <i>Secale cereale</i> L.	Bean, garden— <i>Phaseolus vulgaris</i> L.	Rhubarb— <i>Rheum rhabonticum</i> L.
Ryegrass, Annual or Italian— <i>Lolium multiflorum</i> Lam.	Bean, lima— <i>Phaseolus lunatus</i> L.	Rutabaga— <i>Brassica napus</i> var. <i>napobrassica</i> (L.) Reichb.
Ryegrass, perennial— <i>Lolium perenne</i> L.	Bean, runner— <i>Phaseolus coccineus</i> L.	Salsify— <i>Tragopogon porrifolius</i> L.
Ryegrass, Wimmera— <i>Lolium rigidum</i> Gaud.	Beet— <i>Beta vulgaris</i> L. var. <i>vulgaris</i> .	Sorrel— <i>Rumex acetosa</i> L.
Safflower— <i>Carthamus tinctorius</i> L.	Broadbean— <i>Vicia faba</i> L.	Soybean— <i>Glycine max</i> (L.) Merrill [<i>Soja max</i> (L.) <i>Piper</i>].
Saltbush, fourwing— <i>Atriplex canescens</i> (Pursh.) Nutt.	Broccoli— <i>Brassica oleracea</i> var. <i>botrytis</i> L.	Spinach— <i>Spinacia oleracea</i> L.
Sainfoin— <i>Onobrychis viciifolia</i> Scopoli;	Brussels sprouts— <i>Brassica oleracea</i> var. <i>gemmifera</i> Zenker.	Spinach, New Zealand— <i>Tetragonia tetragonoides</i> (Pall.) Ktze.
Sesame— <i>Sesamum indicum</i> L.	Burdock, great— <i>Arctium lappa</i> L.	Squash— <i>Cucurbita pepo</i> L., <i>C. moschata</i> Duchesne and <i>C. maxima</i> Duchesne.
Sesbania— <i>Sesbania exaltata</i> (Raf.) Torr.	Cabbage— <i>Brassica oleracea</i> var. <i>capitata</i> L.	Tomato— <i>Lycopersicon esculentum</i> Mill.
Smilo— <i>Oryzopsis milacea</i> (L.) Benth and Hook.	Cabbage, tronchuda— <i>Brassica oleracea</i> var. <i>tronchuda</i> Bailey.	Tomato, husk— <i>Physalis pubescens</i> L.
Sorghum alnum— <i>Sorghum alnum</i> Parodi.	Cantaloupe—(see muskmelon)	Turnip— <i>Brassica rapa</i> L.
Sorghum— <i>Sorghum bicolor</i> (L.) Moench.	Cardoon— <i>Cynara cardunculus</i> L.	Watermelon— <i>Citrullus lanatus</i> (Thunb.) Matsum and Nakai.
Sorghum-sudangrass— <i>Sorghum bicolor</i> × <i>S. sudanense</i> .	Carrot— <i>Daucus carota</i> L.	
Sorgrass—Rhizomatous derivatives of a Johnsongrass × sorghum cross or a Johnsongrass × Sudangrass cross.	Cauliflower— <i>Brassica oleracea</i> var. <i>botrytis</i> L.	
Sourclover— <i>Melilotus indica</i> (L.) All.	Celeriac— <i>Apium graveolens</i> var. <i>rapaceum</i> DC.	
Soybean— <i>Glycine max</i> (L.) Merrill [<i>Soja max</i> (L.) <i>Piper</i>].	Celery— <i>Apium graveolens</i> var. <i>dulce</i> (Mill.) Pers.	
Spelt— <i>Triticum spelta</i> L.	Chard, Swiss— <i>Beta vulgaris</i> var. <i>cicla</i> L.	
Sudangrass— <i>Sorghum sudanenses</i> (Piper) Stapf.	Chicory— <i>Cichorium intybus</i> L.	
Sunflower— <i>Helianthus annuus</i> L.	Chinese cabbage— <i>Brassica pekinensis</i> (Lour.) Rupr.	
Sweetclover, white— <i>Melilotus alba</i> Desr.		
Sweetclover, yellow— <i>Melilotus officinalis</i> (L.) Lam.		
Sweet vernalgrass— <i>Anthoxanthum odoratum</i> L.		
Switchgrass— <i>Panicum virgatum</i> L.		
Timothy— <i>Phleum pratense</i> L.		
Timothy, turf— <i>Phleum nodosum</i> (L.) Huds.		
Tobacco— <i>Nicotiana tabacum</i> L.		
Trefoil, big— <i>Lotus uliginosus</i> Schkuhr.		
Trefoil, birdsfoot— <i>Lotus corniculatus</i> L.		
Triticale— <i>× Triticosecale</i> (<i>Secale</i> × <i>Triticum</i>).		
Vaseygrass— <i>Paspalum urvillei</i> Steud.		
Veldtgrass— <i>Ehrharta calycina</i> J. E. Smith.		

nation, and variety of each lot of vegetable seed transported or delivered for transportation in interstate commerce. Such information includes seed samples and records of declarations, labels, purchases, sales, cleaning, bulking, treatment, handling, storage, analyses, tests, and examinations.

(2) The complete record kept by each person for each treatment substance or lot of seed consists of the information pertaining to his own transactions and the information received from others pertaining to their transactions with respect to each treatment substance or lot of seed.

(m) *Declaration*. The term "declaration" means a written statement of a grower, shipper, processor, dealer, or importer giving for any lot of seed the kind, variety, type, origin, or the use for which the seed is intended.

(n) *Declaration of origin*. The term "declaration of origin" means a declaration of a grower or country shipper in the United States stating for each lot of agricultural seed (1) kind of seed, (2) lot number or other identification, (3) State where seed was grown and the county where grown if to be labeled showing the origin as a portion of a State, (4) quantity of seed, (5) date shipped or delivered, (6) to whom sold, shipped, or delivered, and (7) the signature and address of the grower or country shipper issuing the declaration. If the declaration is issued by a grower and the identity of the person delivering the seed is unknown to the receiver, the motor vehicle license number or other identification of the delivering agency should be entered on the declaration by the receiver. If a country shipper's declaration includes seed shipped or delivered to him by another country shipper, it shall give for each lot the other country shipper's lot number as included in the other country shipper's declaration of origin.

(o) *Declaration of kind, variety, or type*. The term "declaration of kind, variety, or type" means a declaration of a grower stating for each lot of seed (1) the name of the kind, variety, or type stated in accordance with §§ 201.9 through 201.12, (2) lot number or other identification, (3) place where seed was grown, (4) quantity of seed, (5) date shipped or delivered, (6) to whom sold, shipped or delivered, and (7) the signature and address of the grower issuing the declaration.

(p) *Mixture*. The term "mixture" means seeds consisting of more than one kind or variety, each present in excess of 5 percent of the whole.

(q) [Reserved]

(r) *Grower*. The term "grower" means any person who produces directly or through a growing contract, or is a seed-crop sharer in seed which is sold, offered for sale, transported, or offered for transportation.

(s) *Country shipper*. The term "country shipper" means any person

located in a producing area who purchases seed locally for shipment to seed dealers or to other country shippers.

(t) *Dealer*. The term "dealer" means any person who cleans, processes, sells, offers for sale, transports, or delivers for transportation seeds in interstate commerce.

(u) *Consumer*. The term "consumer" means any person who purchases or otherwise obtains seed for sowing but not for resale.

(v) *Lot of seed*. The term "lot of seed" means a definite quantity of seed identified by a lot number, every portion or bag of which is uniform, within permitted tolerances, for the factors which appear in the labeling.

(w) *Purity*. The term "purity" means the name or names of the kind, type, or variety and the percentage or percentages thereof; the percentage of other agricultural seed or crop seed; the percentage of weed seeds, including noxious weed seeds; the percentage of inert matter; and the names of the noxious weed seeds and the rate of occurrence of each.

(x) *Inoculant*. The term "inoculant" means a commercial preparation containing nitrogen-fixing bacteria applied to seed.

(y) *Hybrid*. The term "hybrid" applied to kinds or varieties of seed means the first generation seed of a cross produced by controlling the pollination and by combining (1) two or more inbred lines; (2) one inbred or a single cross with an open pollinated variety; or (3) two selected clones, seed lines, varieties, or species. "Controlling the pollination" means to use a method of hybridization which will produce pure seed which is at least 75 percent hybrid seed. Hybrid designations shall be treated as variety names.

(z) *Processing*. For the purpose of section 203 (b)(2)(C) of the act the term "processing" means cleaning, scarifying, or blending to obtain uniform quality, and other operations which would change the purity or germination of the seed and therefore require retesting to determine the quality of the seed, but does not include operations such as packaging, labeling, blending together of uniform lots of the same kind or variety without cleaning, or the preparation of a mixture without cleaning, any of which would not require retesting to determine the quality of the seed.

(aa) "Agricultural Service" means the Agricultural Marketing Service, United States Department of Agriculture.

(bb) *Breeder seed*. Breeder seed is a class of certified seed directly controlled by the originating or sponsoring plant breeding institution, or person, or designee thereof, and is the source for the production of seed of the other classes of certified seed.

(cc) *Foundation seed*. Foundation seed is a class of certified seed which is

the progeny of Breeder or Foundation seed and is produced and handled under procedures established by the certifying agency, in accordance with this part, for producing the Foundation class of seed, for the purpose of maintaining genetic purity and identity.

(dd) *Registered seed*. Registered seed is a class of certified seed which is the progeny of Breeder or Foundation seed and is produced and handled under procedures established by the certifying agency, in accordance with this part, for producing the Registered class of seed, for the purpose of maintaining genetic purity and identity.

(ee) *Certified seed*. Certified seed is a class of certified seed which is the progeny of Breeder, Foundation, or Registered seed, except as provided in § 201.79 and is produced and handled under procedures established by the certifying agency, in accordance with this part, for producing the Certified class of seed, for the purpose of maintaining genetic purity and identity.

(ff) *Off-type*. The term "off-type" means a plant or seed which deviates in one or more characteristics from that which has been described in accordance with § 201.68(c) as being usual for the strain or variety.

(gg) *Inbred line*. The term "inbred line" means a relatively true-breeding strain resulting from at least five successive generations of controlled self-fertilization or of backcrossing to a recurrent parent with selection, or its equivalent, for specific characteristics.

(hh) *Single cross*. The term "single cross" means the first generation hybrid between two inbred lines.

(ii) *Foundation single cross*. The term "foundation single cross" means a single cross used in the production of a double cross, a three-way, or a top cross.

(jj) *Double cross*. The term "double cross" means the first generation hybrid between two single crosses.

(kk) *Top cross*. The term "top cross" means the first generation hybrid of a cross between an inbred line and an open-pollinated variety or the first-generation hybrid between a single cross and an open-pollinated variety.

(ll) *Three-way cross*. The term "three-way cross" means a first generation hybrid between a single cross and an inbred line.

(mm) *Open-pollination*. The term "open-pollination" means pollination that occurs naturally as opposed to controlled pollination, such as by detasselling, cytoplasmic male sterility, self-incompatibility or similar processes.

[5 FR 28, Jan. 4, 1940]

ADMINISTRATION

§ 201.3 Administrator.

The Administrator of the Agricultural Marketing Service shall perform

such duties as the Secretary may require in enforcing the provisions of the act and of the regulations in this part.

[5 FR 30, Jan. 4, 1940, as amended at 13 FR 8731, Dec. 30, 1948; 19 FR 57; Jan. 6, 1954]

RECORDS FOR AGRICULTURAL AND VEGETABLE SEEDS

§ 201.4 Maintenance and accessibility.

(a) Each person transporting or delivering for transportation in interstate commerce agricultural or vegetable seed subject to the act shall keep for a period of 3 years a complete record of each lot of such seed so transported or delivered, including a sample representing each lot of such seed, except that any seed sample may be discarded 1 year after the entire lot represented by such sample has been disposed of by such person.

(b) Each sample of agricultural seed retained shall be at least the weight required for a noxious-weed seed examination as set forth in § 201.46 and each sample of vegetable seed retained shall consist of at least 400 seeds. The record shall be kept in such manner as to permit comparison with the records required to be kept by other persons for the same lot of seed so that the origin treatment, germination, and purity (including variety) of agricultural seed and the treatment, germination and variety of vegetable seed may be traced from the grower to the ultimate consumer and so that the lot of seed may be correctly labeled. The record shall be accessible for inspection by the authorized agents of the Secretary for purposes of the effective administration of the act at any time during customary business hours.

[24 FR 3951, May 15, 1959, as amended at 32 FR 12778, Sept. 6, 1967]

§ 201.5 Origin.

(a) The complete record for any lot of seed of alfalfa, red clover, white clover, or field corn, except hybrid seed corn, shall include a declaration of origin, or information traceable to a declaration of origin or evidence showing that a declaration of origin could not be obtained.

(b) Each country shipper shall retain a copy of each declaration which he issues and shall attach thereto a detailed record showing the names and addresses of growers or country shippers from whom the seed was purchased, the quantity of seed purchased from each, and the date on which it was delivered to him.

[24 FR 3951, May 5, 1959, as amended at 32 FR 12776, Sept. 6, 1967]

§ 201.6 Germination.

The complete record shall include the records of all laboratory tests for germination and hard seed for each lot of seed offered for transportation in whole or in part. The record shall

show the kind of seed, lot number, date of test, percentage of germination and hard seeds, and such other information as may be necessary to show the method used.

[5 FR 30, Jan. 4, 1940]

§ 201.7 Purity (including variety).

The complete record for any lot of seed shall include (a) records of analyses, tests, and examinations including statements of weed seeds, noxious weed seeds, inert matter, other agricultural seeds, and of any determinations of kind, variety, or type and a description of the methods used; and (b) for seeds indistinguishable by seed characteristics, records necessary to disclose the kind, variety, or type, including a grower's declaration of kind, variety, or type or an invoice, or other document establishing the kind, variety, or type to be that stated, and a representative sample of the seed. The grower's declaration shall be obtained and kept by the person procuring the seed from the grower. A copy of the grower's declaration and a sample of the seed shall be retained by the grower.

[5 FR 30, Jan. 4, 1940, as amended at 20 FR 7929, Oct. 21, 1955; 24 FR 3951, May 15, 1959]

§ 201.7a Treated seed.

The complete record for any lot consisting of or containing treated seed shall include records necessary to disclose the name of any substance or substances used in the treatment of such seed, including a label or invoice or other document received from any person establishing the name of any substance or substances used in the treatment to be as stated, and a representative sample of the treated seed.

[32 FR 12778, Sept. 6, 1967]

LABELING AGRICULTURAL SEEDS

§ 201.8 Contents of the label.

The label shall contain the required information in any form that is clearly legible and complies with the regulations in this part. The information may be on a tag attached securely to the container, or may be printed in a conspicuous manner on a side or the top of the container. The label may contain information in addition to that required by the act, provided such information is not misleading.

[5 FR 30 Jan. 4, 1940, as amended at 24 FR 3952, May 15, 1959]

§ 201.9 Kind.

The name of each kind of seed present in excess of 5 percent shall be shown on the label and need not be accompanied by the word "kind." When two or more kinds of seed are named on the label, the name of each kind shall be accompanied by the percentage of each. When only one kind of seed is present in excess of 5 percent

and no variety name or type designation is shown, the percentage of that kind may be shown as "pure seed" and such percentage shall apply only to seed of the kind named.

[5 FR 30, Jan. 4, 1940]

§ 201.10 Variety.

(a) The following kinds of agricultural seeds are generally labeled as to variety and shall be labeled to show the variety name or the words "Variety Not Stated."

Alfalfa; Bahiagrass; Barley; Bean, field; Beet, field; Brome, smooth; Broomcorn; Clover, crimson; Clover, red; Clover, white; Corn, field; Corn, pop; Cotton; Cowpea; Crambe; Fescue, tall; Flax; Lespedeza, striate; Millet, foxtail; Millet, pearl; Oat; Pea, field; Peanut; Rice; Rye; Safflower; Sorghum; Sorghum-sudangrass; Soybean; Sudangrass; Sunflower; Tobacco; Trefoil, birdfoot; Triticale; Wheat, common; Wheat, durum.

(b) If the name of the variety is given, the name may be associated with the name of the kind with or without the words "kind and variety." The percentage in such case, which may be shown as "pure seed," shall apply only to seed of the variety named, except for the labeling of hybrids as provided in § 201.11a. If separate percentages for the kind and the variety or hybrid are shown, the name of the kind and the name of the variety or the term "hybrid" shall be clearly associated with the respective percentages. When two or more varieties are present in excess of 5 percent and are named on the label, the name of each variety shall be accompanied by the percentage of each.

[32 FR 12778, Sept. 6, 1967, and 33 FR 10840, July 31, 1968, as amended at 35 FR 6108, Apr. 15, 1970]

§ 201.11 Type.

(a) When type is designated, such designation may be associated with the name of the kind but shall in all cases be clearly associated with the word "type." The percentage, which may be shown as "pure seed", shall apply only to the type designated. If separate percentages for the kind and the type are shown, such percentages shall be clearly associated with the name of the kind and the name of the type.

(b) If the type designation does not include a variety name, it shall include a name descriptive of a group of varieties of similar character and the pure seed shall be at least 90 percent of one or more varieties all of which conform to the type designation.

(c) If the name of a variety is used as a part of the type designation, the seed shall be of that variety and may contain: (1) An admixture of seed of other indistinguishable varieties of the same kind and of similar character; or, (2) an admixture of indistinguishable seeds having genetic characteristics

dissimilar to the variety named by reason of cross-fertilization with other varieties. In either case, at least 90 percent of the pure seed shall be of the variety named or upon growth shall produce plants having characteristics similar to the variety named.

[5 FR 30, Jan. 4, 1940]

§ 201.11a Hybrid.

If any one kind or kind and variety of seed present in excess of 5 percent is "hybrid" seed, it shall be designated "hybrid" on the label. The percentage that is hybrid shall be at least 95 percent of the percentage of pure seed shown unless the percentage of pure seed which is hybrid seed is shown separately. If two or more kinds or varieties are present in excess of 5 percent and are named on the label, each that is hybrid shall be designated as hybrid on the label. Any one kind or kind and variety that has pure seed which is less than 95 percent but more than 75 percent hybrid seed as a result of incompletely controlled pollination in a cross shall be labeled to show (a) the percentage of pure seed that is hybrid seed or (b) a statement such as "Contains from 75 percent to 95 percent hybrid seed." No one kind or variety of seed shall be labeled as hybrid if the pure seed contains less than 75 percent hybrid seed.

[33 FR 10840, July 31, 1968]

§ 201.12 Name of kind and variety.

The representation of kind or kind and variety shall be confined to the name of the kind or kind and variety determined in accordance with § 201.34. The name shall not have affixed thereto words or terms that create a misleading impression as to the history or characteristics of the kind or variety.

[20 FR 7929, Oct. 21, 1955]

§ 201.12a Lawn and turf seed mixtures.

Seed mixtures intended for lawn and turf purposes shall be designated as a mixture on the label and each seed component shall be listed on the label in the order of predominance.

[49 FR 1172, Jan. 10, 1984]

§ 201.13 Lot number or other identification.

The lot number or other identification shall be shown on the label and shall be the same as that used in the records pertaining to the same lot of seed.

[5 FR 30, Jan. 4, 1940]

§ 201.14 Origin.

(a) Alfalfa, red clover, white clover, and field corn (except hybrid seed corn) shall be labeled to show: (1) The origin, if known; or (2) if the origin is not known, the statement "origin unknown."

(b) Whenever such seed originates in more than one State, the name of each State and the percentage of seed originating in each State shall be given in the order of its predominance. Whenever such seed originates in a portion of a State, it shall be permissible to label such seed as originating in such portion of a State.

(c) Reasonable precautions to insure that the origin of seed is known shall include the maintaining of a record as described in § 201.5. The examination of the seed and any pertinent facts may be taken into consideration in determining whether reasonable precautions have been taken to insure the origin to be that which is represented.

[5 FR 31, Jan. 4, 1940, as amended at 20 FR 7929, Oct. 21, 1955; 32 FR 12779, Sept. 6, 1967]

§ 201.15 Weed seeds.

The percentage of weed seeds shall include seeds of plants considered weeds in the State into which the seed is offered for transportation or transported and shall include noxious weed seeds.

[5 FR 31, Jan. 4, 1940]

§ 201.16 Noxious weed seeds.

The names of the kinds of noxious weed seeds and the rate of occurrence of each shall be expressed in the label in accordance with, and the rate of occurrence shall not exceed the rate permitted by, the law and regulations of the State into which the seed is offered for transportation or is transported. If in the course of such transportation, or thereafter, the seed is diverted to another State of destination, the person or persons responsible for such diversion shall cause the seed to be relabeled with respect to noxious-weed seed content, if necessary, to conform to the laws and regulations of the State to which the seed is diverted.

[5 FR 31, Jan. 4, 1940, as amended at 20 FR 7929, Oct. 21, 1955]

§ 201.17 Noxious-weed seeds in the District of Columbia.

Noxious-weed seeds in the District of Columbia are: Quackgrass (*Agropyron repens*), Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), bermudagrass (*Cynodon dactylon*), giant bermudagrass (*Cynodon dactylon* var. *aridus*), annual bluegrass (*Poa annua*), and wild garlic or wild onion (*Allium canadense* or *Allium vineale*). The name and number per pound of each kind of such noxious-weed seeds present shall be stated on the label.

[32 FR 12779, Sept. 6, 1967, as amended at 35 FR 6108, Apr. 15, 1970]

§ 201.18 Other agricultural seeds (crop seeds).

Agricultural seeds other than those included in the percentage or percentages of kind, variety, or type may be expressed as "crop seeds" or "other crop seeds," but the percentage shall include collectively all kinds, varieties, or types not named upon the label.

[5 FR 31, Jan. 4, 1940]

§ 201.19 Inert matter.

The label shall show the percentage by weight of inert matter.

[5 FR 31, Jan. 4, 1940]

§ 201.20 Germination.

The label shall show the percentage of germination for each kind, or kind and variety, or kind and type, or kind and hybrid of agricultural seed present in excess of 5 percent or shown in the labeling to be present in a proportion of 5 percent or less: *Provided*, That this shall not apply to freshly harvested Kentucky bluegrass or sugar beet seed transported or delivered for transportation during the months of July, August, and September for seeding during the year in which the seed is produced.

[24 FR 3953, May 15, 1959, as amended at 32 FR 12779, Sept. 6, 1967]

§ 201.21 Hard seed.

The label shall show the percentage of hard seed, if any is present, for any seed required to be labeled as to the percentage of germination, and the percentage of hard seed shall not be included as part of the germination percentage.

[24 FR 3953, May 15, 1959]

§ 201.22 Date of test.

(a) The label shall show the month and year in which the germination test was completed. No more than 5 calendar months shall have elapsed between the last day of the month in which the germination test was completed and the date of transportation or delivery for transportation in interstate commerce, except for seed in hermetically sealed containers as provided in § 201.36c in which case no more than 24 calendar months shall have elapsed between the last day of the month in which the germination test was completed prior to packaging and the date of transportation or delivery for transportation in interstate commerce.

(b) In the case of a seed mixture, it is only necessary to state the calendar month and year of such test for the kind or variety or type of agricultural seed contained in such mixture which has the oldest calendar month and year test date among the test conducted on all the kinds or varieties or types of agricultural seed contained in such mixture.

(c) The following kinds shall be tested within the indicated time before interstate shipment:

Agricultural seeds and mixtures thereof	Months from test date to shipment
Bentgrass: <i>Agrostis tenuis</i> and <i>polystris</i>	15
Bluegrass, Kentucky: <i>Poa pratensis</i>	15
Fescue, Chewings: <i>Festuca rubra</i> var. <i>commutata</i>	15
Fescue, Hard: <i>Festuca longifolia</i>	15
Fescue, Red: <i>Festuca rubra</i>	15
Fescue, Tall: <i>Festuca orundinacea</i>	15
Ryegrass, Annual: <i>Lolium multiflorum</i>	15
Ryegrass, Perennial: <i>Lolium perenne</i>	15

[5 FR 31, Jan. 4, 1940, as amended at 32 FR 12779, Sept. 6, 1967; 49 FR 1172, Jan. 10, 1984]

§ 201.23 Name of shipper or consignee.

The full name and address of either the shipper or consignee shall appear upon the label. If the name and address of the shipper are not shown upon the label, a code designation identifying the shipper shall be shown.

[5 FR 31, Jan. 4, 1940]

§ 201.24 Code designation.

The code designation used in lieu of the full name and address of the person who transports or delivers seed for transportation in interstate commerce shall be approved by the Administrator of the Agricultural Marketing Service or such other person as may be designated by him for the purpose. When used, the code designation shall appear on the label in a clear and legible manner.

[5 FR 31, Jan. 4, 1940, as amended at 13 FR 8731, Dec. 30, 1948; 19 FR 57, Jan. 6, 1954]

§ 201.24a Inoculated seed.

Seed claimed to be inoculated shall be labeled to show the month and year beyond which the inoculant on the seed is no longer claimed to be effective by a statement such as, "Inoculant not claimed to be effective after _____ (Month and year)."

[32 FR 12779, Sept. 6, 1967]

LABELING VEGETABLE SEEDS

§ 201.25 Contents of the label.

Vegetable seed in packets and in larger containers shall be labeled with the required information in any form that is clearly legible. Any tag used shall be securely attached to the container. The label may contain information in addition to that required by the act, provided such information is not misleading.

[5 FR 31, Jan. 4, 1940]

§ 201.26 Kind, variety, and hybrid.

The label shall bear the name of each kind and variety present as determined in accordance with § 201.34.

The name shall not have affixed thereto words or terms that create a misleading impression as to the history or characteristics of kind or variety. If two or more kinds or varieties are present, the percentage of each shall be shown. If any one kind or variety named on the label is "hybrid" seed, it shall be so designated on the label. If two or more kinds or varieties are named on the label, each that is hybrid shall be shown as "hybrid" on the label. Any kind or variety that is less than 95 percent but more than 75 percent hybrid seed as a result of incompletely controlled pollination in a cross shall be labeled to show (a) the percentage that is hybrid seed or (b) a statement such as "Contains from 75 percent to 95 percent hybrid seed." No one kind or variety of seed shall be labeled as hybrid if it contains less than 75 percent hybrid seed.

[33 FR 10841, July 31, 1968]

§ 201.27 Name of shipper or consignee.

The full name and address of either the shipper, or consignee, shall appear upon the label except that if the name and address of the shipper are not shown, a code designation identifying the shipper shall be shown.

[5 FR 31, Jan. 4, 1940]

§ 201.28 Code designation.

The code designation used in lieu of the full name and address of the person who transports or delivers seed for transportation in interstate commerce shall be approved by the Administrator of the Agricultural Marketing Service or such other person as may be designated by him for the purpose. When used, the code designation shall appear on the label in a clear and legible manner.

[5 FR 31, Jan. 4, 1940, as amended at 13 FR 8731, Dec. 30, 1948; 19 FR 57, Jan. 6, 1954]

§ 201.29 Germination of vegetable seed in containers of 1 pound or less.

Vegetable seeds in containers of 1 pound or less which have a germination equal to or better than the standard set forth in § 201.31 need not be labeled to show the percentage of germination and date of test. Each variety of vegetable seed which has a germination percentage less than the standard set forth in § 201.31 shall have the words "Below Standard" clearly shown in a conspicuous place on the label or on the face of the container in type no smaller than 8 points. Each variety which germinates less than the standard shall also be labeled to show the percentage of germination and the percentage of hard seed (if any).

[32 FR 12779, Sept. 6, 1967]

§ 201.29a Germination of vegetable seed in containers of more than 1 pound.

Each variety of vegetable seeds in containers of more than 1 pound shall

be labeled to show the percentage of germination and the percentage of hard seed (if any).

[32 FR 12779, Sept. 6, 1967]

§ 201.30 Hard seed.

The label shall show the percentage or hard seed, if any is present, for any seed required to be labeled as to the percentage of germination, and the percentage of hard seed shall not be included as part of the germination percentage.

[32 FR 12779, Sept. 6, 1967]

§ 201.30a Date of test.

When the percentage of germination is required to be shown, the label shall show the month and year in which the germination test was completed. No more than 5 calendar months shall have elapsed between the last day of the month in which the germination test was completed and the date of transportation or delivery for transportation in interstate commerce, except for seed in hermetically sealed containers in which case no more than 24 calendar months shall have elapsed between the last day of the month in which the germination test was completed prior to packaging and the date of transportation or delivery for transportation in interstate commerce.

[32 FR 12779, Sept. 6, 1967]

§ 201.30b Lot number or other lot identification of vegetable seed in containers of more than 1 pound.

The lot number or other lot identification of vegetable seed in containers of more than 1 pound shall be shown on the label and shall be the same as that used in the records pertaining to the same lot of seed.

[35 FR 6108, Apr. 15, 1970]

§ 201.31 Germination standards for vegetable seeds in interstate commerce.

The following germination standards for vegetable seeds in interstate commerce, which shall be construed to include hard seed, are determined and established under section 403(c) of the act:

	Percent
Arlachoke.....	60
Asparagus.....	70
Asparagusbeon.....	75
Bean, garden.....	70
Bean, limo.....	70
Bean, runner.....	75
Beet.....	65
Broadbean.....	75
Broccoli.....	75
Brussels sprouts.....	70
Burdock, great.....	60
Cabbage.....	75
Cabbage, tronchudo.....	70
Contoloupe (See muskmelon).	
Cordon.....	60
Carrot.....	55
Cauliflower.....	75
Celeriac.....	55
Celery.....	55

	Percent
Chard, Swiss.....	65
Chicory.....	65
Chinese cabbage.....	75
Chives.....	50
Citron.....	65
Collards.....	80
Corn, sweet.....	75
Carnsalad.....	70
Cowpea.....	75
Cress, garden.....	75
Cress, upland.....	60
Cress, water.....	40
Cucumber.....	80
Dandelian.....	60
Eggplant.....	60
Endive.....	70
Kale.....	75
Kale, Chinese.....	75
Kale, Siberian.....	75
Kohlrabi.....	75
Leek.....	60
Lettuce.....	80
Muskmelon.....	75
Mustard, India.....	75
Mustard, spinach.....	75
Okra.....	50
Onian.....	70
Onion, Welsh.....	70
Pak-choi.....	75
Parsley.....	60
Parsnip.....	60
Peo.....	80
Pepper.....	55
Pumpkin.....	75
Radish.....	75
Rhubarb.....	60
Rutabaga.....	75
Salsify.....	75
Sarrel.....	65
Soybean.....	75
Spinach.....	60
Spinach, New Zealand.....	40
Squash.....	75
Tomato.....	75
Tomato, husk.....	50
Turnip.....	80
Watermelon.....	70

[15 FR 2394, Apr. 28, 1950, as amended at 20 FR 7929, Oct. 21, 1955; 25 FR 8769, Sept. 13, 1960; 26 FR 10035, Oct. 26, 1961; 27 FR 3252, Apr. 5, 1962; 32 FR 12779, Sept. 6, 1967; 35 FR 6108, Apr. 15, 1970]

LABELING IN GENERAL

§ 201.31a Labeling treated seed.

(a) *Contents of label.* Any agricultural seed or any mixture thereof or any vegetable seed or any mixture thereof, for seeding purposes, that has been treated shall be labeled in type no smaller than 8 point to indicate that the seed has been treated and to show the name of any substance or a description of any process (other than application of a substance) used in such treatment, in accordance with this section; for example,

Treated with _____ (name of substance or process) or _____ (name of substance or process) treated.

If the substance used in such treatment in the amount remaining with the seed is harmful to humans or other vertebrate animals, the seed shall also bear a label containing additional statements as required by paragraphs (c) and (d) of this section. The label shall contain the required information in any form that is clearly legible and complies with the regulations in this part. The information may be on the tag bearing the analysis infor-

mation or on a separate tag, or it may be printed in a conspicuous manner on a side or top of the container.

(b) *Name of substance.* The name of any substance as required by paragraph (a) of this section shall be the commonly accepted coined, chemical (generic), or abbreviated chemical name. Commonly accepted coined names are free for general use by the public, are not private trade-marks, and are commonly recognized as names of particular substances; such as thiram, captan, lindane, and dichlorone. Examples of commonly accepted chemical (generic) names are: bluestone, calcium carbonate, cuprous oxide, zinc hydroxide, hexachlorobenzene, and ethyl mercury acetate. The terms "mercury" or "mercurial" may be used in labeling all types of mercurials. Examples of commonly accepted abbreviated chemical names are: BHC (1, 2, 3, 4, 5, 6-Hexachlorocyclohexane) and DDT (dichloro diphenyl trichloroethane).

(c) *Mercurials and similarly toxic substances.* (1) Seed treated with a mercurial or similarly toxic substance, if any amount remains with the seed, shall be labeled to show a representation of a skull and crossbones at least twice the size of the type used for information required to be on the label under paragraph (a) and shall also include in red letters on a background of distinctly contrasting color a statement worded substantially as follows: "This seed has been treated with Poison," "Treated with Poison," "Poison treated," or "Poison". The word "Poison" shall appear in type no less than 8 point.

(2) Mercurials and similarly toxic substances include the following:

Aldrin, technical
Demeton
Dieldrin
p-Dimethylaminobenzenediazosodium sulfonate
Endrin
Ethion
Heptachlor
Mercurials, all types
Parathion
Phorate
Toxaphene
O - O - Diethyl-O-(isopropyl-4-methyl-6-pyrimidyl) thiophosphate
O, O-Diethyl-S-2-(ethylthio) ethyl phosphorodithioate

Any amount of such substances remaining with the seed is considered harmful within the meaning of this section.

(d) *Other harmful substances.* If a substance, other than one which would be classified as a mercurial or similarly toxic substance under paragraph (c) of this section, is used in the treatment of seed, and the amount remaining with the seed is harmful to humans or other vertebrate animals, the seed shall be labeled with an appropriate caution statement in type no smaller than 8 point worded substantially as follows: "Do not use for

food," "Do not use for feed," "Do not use for oil purposes," or "Do not use for food, feed, or oil purposes." Any amount of any substance, not within paragraph (c) of this section, used in the treatment of the seed, which remains with the seed is considered harmful within the meaning of this section when the seed is in containers of more than 4 ounces, except that the following substances shall not be deemed harmful when present at a rate less than the number of parts per million indicated:

Allethrin—2 p.p.m.
Malathion—8 p.p.m.
Methoxychlor—2 p.p.m.

Piperonyl butoxide—8 p.p.m. on oat and sorghum and 20 p.p.m. on all other seeds.

Pyrethrins—1 p.p.m. on oat and sorghum and 3 p.p.m. on all other seeds.

[24 FR 3953, May 15, 1959, as amended at 25 FR 8769, Sept. 13, 1960; 30 FR 7888, June 18, 1965]

§ 201.32 Screenings.

Screenings shipped in interstate commerce, if in containers, shall be labeled in a legible manner with letters not smaller than 18 point type and, if in bulk, shall be invoiced with the words, "Screenings for processing—not for seeding."

[5 FR 31, Jan. 4, 1940]

§ 201.33 Seed in bulk or large quantities; seed for cleaning or processing.

(a) In the case of seed in bulk, the information required under sections 201(a), (b), and (i) of the act shall appear in the invoice or other records accompanying and pertaining to such seed. If the seed is in containers and in quantities of 20,000 pounds or more, regardless of the number of lots included, the information required on each container under sections 201(a), (b), and (i) of the act need not be shown on each container; *Provided*, That: (1) The omission from each container of a label with the required information is with the knowledge and consent of the consignee prior to the transportation or delivery for transportation of such seed in interstate commerce; (2) each container has stenciled upon it or bears a label containing a lot designation; and (3) the invoice or other records accompanying and pertaining to such seed bear the various statements required for the respective seeds.

(b) Seed consigned to a seed cleaning or processing establishment, for cleaning or processing for seeding purposes, need not be labeled to show the information required on each container under sections 201(a), (b), and (i) of the act if it is in bulk, or in containers and in quantities of 20,000 pounds or more regardless of the number of lots involved, and the invoice or other records accompanying and pertaining to such seed show that it is "Seed for processing," or, if the seed is in con-

tainers and in quantities less than 20,000 pounds and each container bears a label with the words "Seed for processing." If any such seed is later to be labeled as to origin and/or variety, the origin and/or variety as the case may be, shall be shown on the invoice if the seed is in bulk, otherwise, on a label, at the time of transportation to such establishment, except that if it is covered by a declaration of origin and/or variety it will be sufficient if the lot designation appearing in the declaration is placed on the invoice if the seed is in bulk, or on a label if the seed is in containers, regardless of the quantity.

[24 FR 3953, May 15, 1959]

§ 201.34 Kind, variety, and type; treatment substances; designation as hybrid.

(a) *Indistinguishable seed and treatment substances.* Reasonable precautions to insure that the kind, variety, or type of indistinguishable agricultural or vegetable seeds and names of any treatment substance are properly stated shall include the maintaining of the records described in § 201.7 or § 201.7a. The examination of the seed and any pertinent facts may be taken into consideration in determining whether reasonable precautions have been taken to insure the kind, variety, or type of seed or any treatment substance on the seed is that which is shown. Reasonable precautions in labeling ryegrass seed as to kind shall include making or obtaining the results of a fluorescence test unless (1) the shortness of the time interval between receipt of the seed lot and the shipment of the seed in interstate commerce, or (2) dormancy of the seeds in the lot, or (3) other circumstances beyond the control of the shipper prevent such action before the shipment is made. Reasonable precautions in labeling ryegrass seed as to kind shall also include keeping separate each lot labeled on the basis of a separate grower's declaration, invoice, or other documents.

(b) *Name of kind.* The name of each kind of agricultural or vegetable seed is the name listed in § 201.2 (h) or (i), respectively, except that a name which has become synonymous through broad general usage may be substituted therefor, provided the name does not apply to more than one kind and is not misleading.

(c) *Hybrid designation.* Seed shall not be designated in labeling as "hybrid" seed unless it comes within the definition of "hybrid" in § 201.2(y).

(d) *Name of variety.* The name of each variety of agricultural or vegetable seed is the name determined in accordance with the following considerations:

(1) The variety name shall represent a subdivision of a kind, which is characterized by growth, plant, fruit, seed, or other characters by which it can be

differentiated from other sorts of the same kind.

(2) Except as otherwise provided in this section, the name of a new variety shall be the name given by the originator or discoverer of the variety, except that in the event the originator or discoverer of a new unnamed variety, at the time seed of the variety is first introduced into channels of commerce of the United States for sale to the public, cannot or chooses not to name the variety, the name of the variety shall be the first name under which the seed is introduced into such commerce. However, if the variety name so provided is in a language not using the Roman alphabet, the variety shall be given a name by the person authorized under this paragraph to name the variety, in a language using the Roman alphabet.

(3) The variety name shall not be misleading. The same variety name shall not be assigned to more than one variety of the same kind of seed.

(4) The status under the Federal Seed Act of a variety name is not modified by the registration of such name as a trademark.

(5) Names of varieties which through broad general usage prior to the effective date of this section¹ were recognized variety names, except for hybrid seed corn, shall be considered variety names without regard to the principles stated in paragraph (d)(2) of this section.

(6) The variety name for any variety of hybrid seed corn first introduced into commercial channels in the United States for sale prior to October 20, 1951, shall be any name used for such variety in such channels prior to that date. The variety name for any variety of hybrid seed corn first introduced into commercial channels in the United States for sale on or after October 20, 1951, shall be the name assigned in accordance with paragraphs (d)(1) through (4) of this section.

(e) *List of variety names.* Variety names for the kinds listed include the following: (Names enclosed in parentheses are synonyms. This list does not preclude the use of names not on the list but entitled to be recognized under paragraph (d) of this section).

(1) *Bean, garden.*

Abunda.
Asgrow Black Valentine (Stringless Black Valentine; Black Valentine Stringless).

Astro.
Bountiful (Improved Six Weeks).
Bountiful Canner.
Brilliant.
Brittle Wax (Burpee's Brittle Wax; Round Pod Kidney Wax).
Bush Blue Lake.
Bush Blue Lake 274.
Cherokee (Black Valentine Wax; Cherokee Wax; Valentine Wax).

Choctaw.
Comet.

Commodore Improved (Improved Commodore).
Contender.

Corneli 14.
Davis Stringless Wax (Davis Stringless White Wax; Stringless Davis Wax).
Earliegreen.

Early Harvest.

Early Gallatin.

Encore.

Extender.

Flash.

Florida Belle.

Full Measure.

Gallatin No. 50.

Gardengreen.

Giant Stringless Green Pod.

Glades.

Greencrop.

Harter.

Harvest King.

Harvester.

Higrade.

Idagreen.

Idaho Refugee.

Idelight.

Improved Higrade.

Improved Kidney Wax (Improved Stringless Kidney Wax; Kidney Wax; Stringless Kidney Wax).

Improved Tendergreen (Improved New Stringless; Resistant Tendergreen).

Keystonian.

King Green.

Kinghorn Special.

Logan.

Longreen.

Lonval.

Mountaineer.

New Top Notch Golden Wax.

Orbit.

Pearlgreen.

Pencil Pod Black Wax.

Pittsfield.

Plentiful (Black Seeded Bountiful; Ferry's Plentiful).

Pompano.

Processor.

Puregold Wax.

Purple Royalty.

Ranger.

Resistant Asgrow Valentine.

Resistant Cherokee.

Rival.

Seminole.

Sensation Refugee—1066.

Sensation Refugee—1071.

Sensation Wax No. 1.

Slendergreen.

Slenderwhite.

Slimgreen.

Spartan Arrow.

Streamliner (Granda; World's Fair).

Stringless Green Pod (Burpee's Stringless Green Pod; Landreth's Stringless Green Pod).

Stringless Red Valentine (Landreth's Extra Early Stringless Red Valentine; Red Valentine Stringless).

Supergreen.

Sure Crop (Bountiful Wax; Sure Crop Black Wax; Sure Crop Stringless Wax; Sure Crop Wax; Yellow Bountiful Wax).

Tenderbest.

Tendercrop.

Tenderette.

Tendergreen (Asgrow Stringless Green Pod; New Stringless Green Pod).

Tendergreen No. 32304.

Tenderlong 15.

Tender Pod.

Tender-white.

Tennessee Green Pod (Brown Bunch; Field's First Early; Knife Blade; Mayo's Brown Bunch).

Tiny Green.
 Topcrop.
 Topmost.
 Top Notch Golden Wax (Landreth's Top Notch Golden Wax).
 Trugreen.
 Unrivalled Wax.
 U.S. No. 5 Refugee.
 Wade.
 Wadex.
 White Seeded Contender.
 White-Seeded Tendergreen.
 Woodruff's Hyscore.
 Yakima.
 (2) *Cabbage*.
 All Head Early (Burpee's All Head Early).
 All Head Select (Wisconsin All Head).
 All Year.
 American Drumhead Savoy (Improved American Savoy; Long Island Savoy; Perfection Drumhead Savoy; Perfection Late Savoy).
 Babyhead.
 Badger Ballhead.
 Badger Market.
 Badger Shipper.
 Bonanza.
 Bugner.
 C. C. Cross Hybrid.
 Canadian Acre.
 Charleston Wakefield (Charleston; Large Charleston Wakefield; Large Jersey; Large Wakefield).
 Chieftain Savoy.
 Copenhagen Market Early (Condon's Cannon Ball; Copenhagen Market; Extra Early Copenhagen Market; Viking Copenhagen).
 Copenhagen Market Medium.
 Danish Ballhead.
 Danish Ballhead, Harris Special.
 Donk's Danish Ballhead.
 Early Jersey Wakefield (Extra Early Wakefield; Jersey Wakefield).
 Early Marvel.
 Eastern States Ballhead.
 Empire Danish.
 Ferry's Hollander.
 Ferry's Round Dutch (Early Round Dutch).
 Florida Danish.
 Globe.
 Glory of Enkhuizen (Enkhuizen Glory).
 Golden Acre (Peerless Special; Premier).
 Green Acre (Dark Green Copenhagen).
 Greenback.
 Harris Resistant Danish.
 Improved Danish No. 22.
 Improved Wisconsin All Seasons.
 Improved Wisconsin Ballhead.
 Jersey Queen.
 Mammoth Rock Red (Mammoth Red Rock).
 Marion Market.
 Market Master.
 Midseason Market.
 Morse's Large Red.
 Oakview Ballhead.
 O. S. Cross.
 Penn State Ballhead.
 Pennvalley.
 Premium Late Flat Dutch (Large Late Flat Dutch; Late Flat Dutch).
 Racine Market.
 Red Acre.
 Red Danish.
 Reed's Improved Glory.
 Resistant Detroit (Detroit Resistant).
 Resistant Glory.
 Resistant Golden Acre (Golden Acre Resistant).
 Resistant Red Acre.
 Resistant Red Hollander.
 Round Red Dutch.
 Seneca Ballhead.
 Slow Bolting Green.

Stein's Flat Dutch (Early Flat Dutch; Stein's Early Flat Dutch).
 Succession (All Season; Henderson's Succession).
 Wisconsin Ballhead Improved.
 Wisconsin Copenhagen.
 Wisconsin Golden Acre.
 Wisconsin Hollander (Wisconsin No. 8; Wisconsin Hollander No. 8).
 YR Charleston Wakefield.
 (3) *Onions, hybrid*.
 Abundance.
 Alamo.
 Aristocrat.
 Asgrow B46.
 Asgrow B47.
 Asgrow W 1.
 Asgrow W 3.
 Asgrow W 45.
 Asgrow Y 2.
 Asgrow Y40.
 Asgrow Y41.
 Asgrow Y42.
 Asgrow Y43.
 Asgrow Y44.
 Asgrow Y 49.
 Asgrow Y 50.
 Asgrow Y50K.
 Asgrow Y 51.
 Asgrow Y 52.
 Asgrow Y 53.
 Autumn Bronze.
 Autumn Brown.
 Autumn Chief.
 Autumn Glory.
 Autumn Spice.
 Autumn Splendor.
 Autumn Star.
 Autumn Topper.
 Bonanza.
 Brilliance.
 Bronze Perfection.
 Brown Beauty.
 Burpee Crystal Wax Hybrid.
 Burpee Sweet Spanish Hybrid.
 Burpee Yellow Globe Hybrid.
 California Hybrid Red No. 1.
 Castilian.
 Champion.
 Chieftain.
 Contender.
 Crystal Hybrid.
 Dessex.
 Early Gold.
 Early Harvest.
 Elba Globe.
 El Capitan.
 Elite.
 Empire.
 Empire State.
 Encore.
 Epoch.
 Fiesta.
 Golden Beauty.
 Grandee.
 Granex.
 Granex 33.
 Henry's Special.
 Hickory.
 Highlight.
 Magnifico.
 Mohawk.
 Nugget.
 Ontario.
 Parman.
 Pilot.
 Pioneer.
 Premier.
 Pronto.
 Snow White.
 Spartan.
 Spartan Banner.
 Spartan Era.
 Spartan Gem.

Sunburst.
 Surprise.
 Treasure.
 Vaughan's Hybrid Sweet Spanish No. 1.
 White Granex.
 White Granite.
 Yellow Spanish Hybrid P-W 160.
 (4) *Soybeans*.
 Acadian.
 Acme.
 Adams.
 Agate.
 Altona.
 Amredo.
 Amsoy.
 Aoda.
 Arisoy.
 Arkan.
 Arksoy (Early Wood's Yellow).
 Arksoy 2913.
 Avoyelles.
 Bansei.
 Barchet.
 Bavender Special.
 Bethel.
 Bienville.
 Biloxi (Brown Biloxi).
 Blackhawk.
 Boone.
 Bossier.
 Bragg.
 Capital.
 Cayuga.
 Chame.
 Charles.
 Cherokee.
 Chief.
 Chippewa.
 Chippewa 64.
 Chusei.
 Clark.
 Clark 63.
 Clemson.
 C. N. S.
 CNS-4.
 CNS-24.
 Comet.
 Creole.
 Crest.
 Cypress No. 1.
 Dare.
 Davis.
 Delmar.
 Delsoy (Edsoy).
 Delsta.
 Dorman.
 Dortschsoy No. 2.
 Dortschsoy No. 31.
 Dortschsoy No. 67.
 Dunfield.
 Earlyana.
 Easycook.
 Ebony.
 Emperor.
 Etum (Soy Good).
 Flambeau.
 Ford.
 Funk Delicious.
 Gatan.
 Georgian.
 Giant Green.
 Gibson.
 Goldsoy.
 Granger.
 Grant.
 Habaro.
 Haberlandt.
 Hahto (Lima Soy).
 Hakote.
 Hampton 266.
 Hardee.
 Hardome.
 Hark.
 Harly.

Harman.	Ralsoy.	Dwarf Kafir 44-14 (Kafir 44-14).	
Harosoy.	Rebel.	Dwarf White Durra.	
Harosoy 63.	Renville.	Dwarf Yellow Milo.	
Hawkeye.	Richland.	Early Hegari (Arizona Early Hegari; New Mexico Early Hegari).	
Hawkeye 63.	Roanoke.	Early Kalo.	
Hayseed.	Roe.	Early Sumac (Kansas Sumac).	
Henry.	Rokusun.	Edwards Combine.	
Herman.	Rose Non Pop.	Ellis.	
Hidatsa.	Ross.	Folger (Early Folger; Folger's Early).	
Higan.	S-100.	Fremont.	
Hill.	Sac.	Fulk Combine Kafir.	
Hokkaido.	Scioto.	Gooseneck.	
Hongkong.	Scott.	Gurno.	
Hood.	Seminole.	Hegari.	
Illini (Green Field).	Semmes.	Hi-Hegari.	
Imperial.	Seneca.	Hodo.	
Improved Pelican.	Shelby.	Honey (Texas Seeded Ribbon Cane).	
Jackson.	Sioux.	Jo-hee.	
JEW 45.	Smith Super.	Kansas Collier 704-D.	
Jogun.	Sousei (Super Quick).	Kansas Orange.	
Kabott.	Tanner (Brown Otootan; Red Otootan; Red Tanner).	Kansas Sourless.	
Kanrich.	Tastee.	Kansas Sourless 704-H.	
Kanro.	Tennessee Non Pop.	Leoti (Leoti Red).	
Kanum.	Tokyo (Austrian Green; Ita Mame; Late Ita Mame; Mamotoc; Medium Ita Mame; Southern Medium Green).	Martin (Martin Combine Milo).	
Kent.	Traverse.	Meloland.	
Kim.	Viking.	Midak.	
Kingwa (Pekwa).	Virginia (Early Virginia Brown; Virginia Brown; Virginia Early Brown).	Midland.	
Kino.	Volstate.	Norghum.	
Korean (Early Korean).	Wabash.	Norkan.	
Kura.	Wayne.	Norkota.	
Laredo.	Willomi.	Plainsman.	
Lee.	Wilson (Early Wilson; Early Wilson Black; Wilson Black; Wilson Early; Wilson Early Black).	Rancher.	
Lincoln.	Wisconsin Black (Early Black; Early Wisconsin Black; Extra Early Black; Wisconsin Early Black).	Red Amber.	
Lindarin.	Wolverine.	Redbine—58.	
Lindarin 63.	Woods Yellow.	Redbine—60.	
L. Z.	Yellow Gantan.	Redbine—66.	
Macoupin.	Yelando.	Red Kafir.	
Madison.	Yelredo.	Redlan.	
Magnolia.	(5) <i>Striate lespedeza</i> .		
Majos.	Common.	Reliance.	
Mamloxi.	Kobe.	Resistant Wheatland.	
Mammoth Brown (Brown; Giant Brown; Large Brown; Tarheel Brown).	Tennessee 76.	Red (Red x).	
Mammoth Yellow (Large Yellow; Late; Late Yellow; Mammoth; Southern; Yellow).	(6) <i>Sorghum</i> .		
Mamotan.	<i>Sorghum (open-pollinated)</i>		
Mammedo.	African Millet 65.	Rox Orange (Waconia Orange; Yellow Orange; Early Orange).	
Manchu.	Ajax (Imperial Kafir).	Sapling.	
Manchu No. 3.	Atlas.	Sart.	
Manchu No. 606.	Axtell.	Schrock Kafir (Sagrain).	
Manchukota.	Black Amber (Minnesota Amber; Waconia Amber; Early Amber; Early Black Amber).	Shallu.	
Mandarin (Early Mandarin).	Bonita.	Sourless (African Millet; Sourless Orange; Sourless White Orange).	
Mandarin No. 507.	Brawley.	Standard Blackhull Kafir.	
Mandarin (Ottawa).	Caprock.	Sugar Drip (Golden Drip).	
Mandell.	Carman.	Sumac (Red Top).	
Mendota.	Coes.	Sumac 1712.	
Merit.	Colby.	Sumac 6550.	
Mingo.	Collier (Kansas Collier).	Texas Milo (Texas 338).	
Minsoy (Minnsoya).	Colman (Red Orange; Old Mexican Cane).	Texioca—54.	
Missoy.	Combine Bonita.	Tracy.	
Monetta.	Combine Hegari.	Tricker.	
Monroe.	Combine Kafir-60.	Western Blackhull Kafir.	
Montreal Manchu.	Combine Sagrain.	Westland.	
Morse (Siegenthaler).	Combine Shallu.	Wiley.	
Mount Carmel.	Combine 7078.	Williams.	
Mukden.	Crystal Drip.	Winner.	
Nanda.	Cuban.	89-30-S.	
Nanking.	Darset.	<i>Sorghum, hybrid</i>	
Norchief.	Darso.	375.	
Norsoy.	Day Milo.	388.	
Ogden.	Double Dwarf White Sooner Milo.	400B.	
Ontario.	Double Dwarf Yellow Milo.	400C.	
Otootan.	Double Dwarf Yellow Sooner Milo.	400E.	
Pagoda.	Double Dwarf 38 Milo.	400F.	
Palmetto.	Dual.	401.	
Patoka.	Dwarf Feterita.	409.	
Patterson.		410B.	
Peking (Black Champion; Black Sable; Essex; Extra Select Sable; Pedigreed Sable; Red Sable; Sable; Wings Royal).		410C.	
Pelican.		410E.	
Pennsoy.		411.	
Perry.		413.	
Pickett.		AKS 614.	
Portage.		Amak R-10.	
Pridesoy No. 57.		Amak R-12.	
		Apache.	

Aztec.
B-32.
Beefbuilder.
Beefbuilder R.
Beefbuilder T.
C-44A.
C-44B.
C-45.
Cheyenne.
Coastal.
Coastal S.
Coastal T.
Colorado 585.
Colorado 604.
Colorado 606.
Comanche.
Crop Guard.
D-50A.
D-55.
Dairy D.
Double T.
Duet.
E-56A.
E-57.
F-60.
F-61.
F-62A.
F-63.
F-65.
F-66.
F-70.
FS-1.
FS-1A.
FS-22.
FS-38.
FS-300R.
Ga. 609.
Ga. 615.
Gaucho.
Ho-K.
Horizon 64.
Horizon 79.
Horizon 80.
Horizon F-12.
Horizon SF 20.
Kiowa.
KS 602.
KS 603.
KS 651.
KS 652.
KS 701.
Leafmaster 43.
Lindsey 92-F.
Lindsey 101-F.
Lindsey 115-F.
Lindsey 722.
Lindsey 744.
Lindsey 755.
Lindsey 788.
NB 304F.
NB 305F.
NB 504.
NB 505.
OK 612.
OK 613.
OK 627.
OK 632.
P.A.G. 275.
P.A.G. 304.
P.A.G. 400.
P.A.G. 405.
P.A.G. 425.
P.A.G. 428.
P.A.G. 430.
P.A.G. 435.
P.A.G. 465.
P.A.G. 494.
P.A.G. 515.
P.A.G. 605.
P.A.F. 625.
Pronto.
R-106.
R-108.
R-211.
R-212.
R-214.

Raider B.
Ranger.
Ranger A.
Ranger B.
Redhead.
Red Raider.
Red Raider A.
Rico.
Rocket.
Rocket A.
RS 301 F.
RS 302 F.
RS 303 F.
RS 501.
RS 590.
RS 610.
RS 617.
RS 616.
RS 619.
RS 621.
RS 622.
RS 623.
RS 624.
RS 625.
RS 626.
RS 630.
RS 640.
RS 650.
RS 661.
RS 671.
RS 681.
RS 702.
S-210.
S-212.
S-214.
Sandfighter.
SD 252 F.
SD 441.
SD 451.
Shorty 33.
Shorty 40.
Shorty 50.
Silo King.
Tasco.
T-700.
T-E 55.
T-E 66.
T-E 77.
T-E Goldmaker.
T-E Grainmaster.
T-E Silomaker.
T-E Yieldmaker.
Texas 601.
Texas 611.
Texas 620.
Texas 660.
Titan.
Titan R.
Triple T.
Ute.
WAC 700.
Windbreaker.

(7) *Broomcorn.*

Black Spanish (Black Jap; Extra Early Japanese; Japanese).
Black Spanish Dwarf.
Evergreen (Austrian; Illinois Favorite; Standard; White Italian).
Evergreen Dwarf (Acme; Dwarf Evergreen; Long, Brush Dwarf; Western Dwarf).
Miller's No. 8.
Okaw.
Pfeifer Head No. 125.
Rennel's Dwarf No. 11.
Scarborough.
No. 7 Scarborough Dwarf (Miller's No. 7).

(8) *Sorghum-sudangrass hybrids.*

Ga-Su.
Good Grazin.
Grazer.
Grazer 21.
Honey Sweet.
Hi-Dan 35.

Hi-Dan 37.
Hi-Dan 38.
Horizon P-100.
Horizon SP-110.
Hy-King-Su.
Hy-Su.
Kow Kandy.
L Grace 200.
Lindsey 77F.
Morgain.
Grazer 22.
Grazer A.
Greenlan.
Green M.
NB 280S.
Red "T" Graze.
S-100.
Sudine.
Su-Graze.
Sure Graze.
Sweet Sioux.
SX-11.
SX-12.
T-E Grazemaster.
T-E Haygrazer.
[20 FR 7928, Oct. 21, 1955]

§ 201.35 Blank spaces.

Blank spaces on the label shall be deemed to imply the word "None," when such interpretation is reasonable.

[5 FR 32, Jan. 4, 1940]

§ 201.36 The words "free" and "none."

The words "free" and "none" shall be construed to mean that none were found in a test complying with the methods set forth in §§ 201.45—201.52.

[5 FR 32, Jan. 4, 1940]

MODIFYING STATEMENTS

§ 201.36a Disclaimers and nonwarranties.

A disclaimer, nonwarranty, or limited warranty used in any invoice or other labeling, or advertisement shall not directly or indirectly deny or modify any information required by the act or the regulations in this part.

[15 FR 2394, Apr. 28, 1950]

ADVERTISING

§ 201.36b Name of kind and variety; designation as hybrid.

(a) The representation of the name of a kind or kind and variety of seed in any advertisement subject to the act shall be confined to the name of the kind or kind and variety determined in accordance with § 201.34. The name shall not have associated therewith words or terms that create a misleading impression as to the history or characteristics of the kind or kind and variety. Descriptive terms and firm names may be used in kind or variety names provided the descriptive terms or firm names are a part of the name or variety of seed; for example, Stringless Green Pod, Detroit Dark Red, Black Seeded Simpson and Henderson Bush Lima. Seed shall not be designated as hybrid seed in any advertisement subject to the act unless it comes

within the definition of "hybrid" in § 201.2(y).

(b) Terms descriptive as to color, shape, size, habit of growth, disease-resistance, or other characteristics of the kind or variety may be associated with the name of the kind or variety provided it is done in a manner which clearly indicates the descriptive term is not a part of the name of the kind or variety; for example, Oshkosh pepper (yellow), Copenhagen Market (round head) cabbage, and Kentucky Wonder (pole) bean.

(c) Terms descriptive of quality or origin and terms descriptive of the basis for representations made may be associated with the name of the kind or variety: *Provided*, That the terms are clearly identified as being other than part of the name of the kind or variety; for example, Fancy quality redtop, Idaho origin alfalfa, and Grower's affidavit of variety Atlas sorghum.

(d) Terms descriptive of the manner or method of production or processing the seed (for example, certified, registered, delinted, scarified, treated, and hulled), may be associated with the name of the kind or variety of seed, providing such terms are not misleading.

(e) Brand names and terms taken from trademarks may be associated with the name of the kind or variety of seed as an indication of source: *Provided*, That the terms are clearly identified as being other than a part of the name of the kind or variety; for example, Ox Brand Golden Cross sweet corn. Seed shall not be advertised under a trademark or brand name in any manner that may create the impression that the trademark or brand name is a variety name. If seed advertised under a trademark or brand name is a mixture of varieties and if the variety names are not stated in the advertising, a description similar to a varietal description or a comparison with a named variety shall not be used if it creates the impression that the seed is of a single variety.

[21 FR 4652, June 27, 1956, as amended at 32 FR 12780, Sept. 6, 1967]

HERMETICALLY-SEALED CONTAINERS

§ 201.36c Hermetically-sealed containers.

The 5-month limitation on the date of test in §§ 201.22 and 201.30a shall not apply when the following conditions have been met:

(a) The seed was packaged within 9 months after harvest;

(b) The container used does not allow water vapor penetration through any wall, including the seals, greater than 0.05 grams of water per 24 hours per 100 square inches of surface at 100° F. with a relative humidity on one side of 90 percent and on the other side of 0 percent. Water vapor penetration or WVP is measured by the standards of the U.S. Bureau of Standards as:

gm. H₂O/24 hr./100 sq. in./100° F./90% RH
V.0% RH;

(c) The seed in the container does not exceed the percentage of moisture, on a wet weight basis, as listed below:

Agricultural seeds	Percent
Beet, field.....	7.5
Beet, sugar.....	7.5
Bluegrass, Kentucky.....	6.0
Claver, crimson.....	8.0
Fescue, red.....	8.0
Bean.....	7.0
Bean, lima.....	7.0
Beet.....	7.5
Braccali.....	5.0
Brussels sprouts.....	5.0
Cabbage.....	5.0
Carrot.....	7.0
Cauliflower.....	5.0
Celeriac.....	7.0
Celery.....	7.0
Chard, Swiss.....	7.5
Chinese cabbage.....	5.0
Chives.....	6.5
Callards.....	5.0
Corn, sweet.....	8.0
Cucumber.....	6.0
Eggplant.....	6.0
Kale.....	5.0
Ryegrass, annual.....	8.0
Ryegrass, perennial.....	8.0
All others.....	6.0
Kohlrabi.....	5.0
Leek.....	6.5
Lettuce.....	5.5
Muskmelan.....	6.0
Mustard.....	5.0
Onian.....	6.5
Onian, Welsh.....	6.5
Parsley.....	6.5
Parsnip.....	6.0
Pea.....	7.0
Pepper.....	4.5
Pumpkin.....	6.0
Radish.....	5.0
Rutabaga.....	5.0
Spinach.....	8.0
Squash.....	6.0
Tomato.....	5.5
Turnip.....	5.0
Watermelon.....	6.5
All others.....	6.0

(d) The container is conspicuously labeled in not less than 8 point type to indicate (1) that the container is hermetically sealed, (2) that the seed has been preconditioned as to moisture content, and (3) the calendar month and year in which the germination test was completed.

(e) The percentage of germination of vegetable seed at the time of packaging was equal to or above the standards in § 201.31.

[32 FR 12780, Sept. 6, 1967]

INSPECTION

§ 201.37 Authorization.

When authorized by the Administrator of the Agricultural Marketing Service, or by such other person as may be designated for the purpose, Federal employees and qualified State officials, for the purposes of the act, may draw samples of, secure information and inspect records pertaining to, and otherwise inspect seeds and screenings subject to the act.

[15 FR 2394, Apr. 28, 1950]

§ 201.38 Importations.

Prior to release into the commerce of the United States, imported seed and screenings shall be inspected as provided in §§ 201.208 and 201.209.

[5 FR 32, Jan. 4, 1940]

SAMPLING IN THE ADMINISTRATION OF THE ACT

§ 201.39 General procedure.

(a) In order to secure a representative sample, equal portions shall be taken from evenly distributed parts of the quantity of seed or screenings to be sampled. Access shall be had to all parts of that quantity. When more than one trierful of seed is drawn from a bag, different paths shall be followed. When more than one handful is taken from a bag, the handfuls shall be taken from well-separated points.

(b) For free-flowing seed in bags or bulk, a probe or trier shall be used. For small free-flowing seed in bags a probe or trier long enough to sample all portions of the bag should be used.

(c) Non-free-flowing seed, such as certain grass seed, uncleaned seed, or screenings, difficult to sample with a probe or trier, shall be sampled by thrusting the hand into the bulk and withdrawing representative portions. The hand is inserted in an open position and the fingers are held closely together while the hand is being inserted and the portion withdrawn.

(d) As the seed or screenings are sampled, each portion shall be examined. If there appears to be a lack of uniformity, the portions shall not be combined into a composite sample but shall be retained as separate samples or combined to form individual-container samples to determine such lack of uniformity as may exist.

(e) When the portions appear to be uniform, they shall be combined to form a composite sample.

[5 FR 32, Jan. 4, 1940, as amended at 10 FR 9950, Aug. 11, 1945; 25 FR 8769, Sept. 13, 1960; 26 FR 10035, Oct. 26, 1961]

§ 201.40 Bulk.

Bulk seeds or screenings shall be sampled by inserting a long probe or thrusting the hand into the bulk as circumstances require in at least seven uniformly distributed parts of the quantity being sampled. At least as many trierfuls or handfuls shall be taken as the minimum which would be required for the same quantity of seed or screenings in bags of a size customarily used for such seed or screenings.

[5 FR 32, Jan. 4, 1940, as amended at 26 FR 10035, Oct. 26, 1961]

§ 201.41 Bags.

(a) For lots of six bags or less, each bag shall be sampled. A total of at least five trierfuls shall be taken.

(b) For lots of more than six bags, five bags plus at least 10 percent of

the number of bags in the lot shall be sampled. (Round off numbers with decimals to the nearest whole number, raising 0.5 to the next whole number.) Regardless of the lot size it is not necessary that more than 30 bags be sampled.

(c) Samples shall be drawn from unopened bags except under circumstances where the identity of the seed has been preserved.

[5 FR 32, Jan. 4, 1940, as amended at 26 FR 10035, Oct. 26, 1961]

§ 201.42 Small containers.

In sampling seed in small containers that it is not practical to sample as required in § 201.41, a portion of one unopened container or one or more entire unopened containers may be taken to supply a minimum size sample, as required in § 201.43.

[30 FR 7888, June 18, 1965]

§ 201.43 Size of sample.

The following are minimum sizes of samples of agricultural seed, vegetable seed and screenings to be submitted for analysis, test, or examination:

(a) Two ounces of grass seed not otherwise mentioned, white or alsike clover, or seeds not larger than these.

(b) Five ounces of red or crimson clover, alfalfa, lespedeza, ryegrass, bromegrass, millet, flax, rape, or seeds of similar size.

(c) One pound of Sudangrass, proso, hemp or seeds of similar size.

(d) Two pounds of cereals, sorghum, vetch, or seeds of similar or larger size.

(e) Two quarts of screenings.

(f) Vegetable seed samples shall consist of at least 400 seeds.

[10 FR 9950, Aug. 11, 1945, as amended at 15 FR 2394, Apr. 28, 1950; 41 FR 20156, May 17, 1976]

§ 201.44 Forwarding samples.

Before being forwarded for analysis, test, or examination, the containers of samples shall be properly sealed and identified in such manner as may be prescribed by the Agricultural Marketing Service.

[5 FR 32, Jan. 4, 1940, as amended at 10 FR 13489, Nov. 1, 1945]

PURITY ANALYSIS IN THE ADMINISTRATION OF THE ACT

§ 201.45 Obtaining the working sample.

(a) The working sample on which the actual analysis is made shall be taken from the submitted sample in such a manner that it will be representative.

(b) The sample shall be repeatedly divided to the weight to be used for the working sample. Some form of efficient mechanical divider should be used. To avoid damaging large seeds, a divider should be used which will prevent the seeds from falling great distances onto hard surfaces. In case the proper mechanical divider cannot be used or is not available, the sample shall be thoroughly mixed and placed in a pile and the pile shall be repeatedly divided into halves until a sample of the desired weight remains.

[5 FR 32, Jan. 4, 1940, as amended at 20 FR 7929, Oct. 21, 1955; 25 FR 8769, Sept. 13, 1960]

§ 201.46 Weight of working sample.

(a) *Unmixed seed.* The working samples for purity analysis and noxious-weed seed examination of unmixed seed shall be at least the weights set forth in table 1.

(b) *Mixtures consisting of one predominant kind of seed or a group of kinds of similar size.* The weights of the purity and noxious-weed seed working samples in this category shall be determined by the kind or group of kinds which compromise more than 50 percent of the sample.

(c) *Mixtures consisting of two or more kinds or groups of kinds of different sizes, none of which comprise over 50 percent of the sample.* The weights of the purity working samples in this category shall be the weighted averages (to the nearest half gram) of the weights listed in table 1 for each of the kinds which comprise the sample determined by the following method: (1) Multiply the percentage of each component in the mixture (rounded off to the nearest whole number) by the sample sizes specified in column 2, table 1, (2) add all these products, (3) total the percentages of all components of the mixtures, and (4) divide the sum in paragraph (c)(2) of this section by the total in paragraph (c)(3) of this section. If the approximate percentage of the components of a mixture are not known they may be estimated. The weight of the noxious-weed seed working sample shall be determined by multiplying the weight of the purity working sample by 10 or by calculating the weighted average in the same manner described above for the purity working sample.

Table 1—Weight of Working Sample

Name of seed	Minimum weight for purity analysis (Grams)	Minimum weight for noxious-weed seed examination (Grams)	Approximate number of seeds per gram (Grams)
agricultural seed			
Alfalfa— <i>Medicago sativa</i>	5	50	500
Afilaria— <i>Eradium cicutarium</i>	5	50	440
Alyceclover— <i>Alysicarpus vaginalis</i>	5	50	665
Bahiagrass— <i>Paspalum notatum</i> :			
Var. Pensacala	5	50	600
All other vars.....	7	50	365
Barley— <i>Hordeum vulgare</i>	100	500	30
Barrelclover— <i>Medicago tribulaoides</i>	50	300	.....
Bean:			
Adzuki— <i>Vigna angularis</i>	200	500	11
Field— <i>Phaseolus vulgaris</i>	500	500	4
Mung— <i>Vigna radiata</i>	100	500	24
Beet, field— <i>Beta vulgaris</i>	50	500	55
Beet, sugar— <i>Beta vulgaris</i>	50	500	55
Beggarweed, Florida— <i>Desmodium tartuifosum</i>	5	50	440
Bentgrass:			
Colonial (incl. Astoria and Highland)— <i>Agrastis tenuis</i>	1/4	2.5	13,000
Creeping— <i>Agrastis stolonifera</i> var. <i>palustris</i>	1/4	2.5	13,515
Velvet— <i>Agrastis canina</i>	1/4	2.5	18,180
Bermudagrass— <i>Cynodon dactylon</i>	1	10	3,930
Bermudagrass, giant— <i>Cynodon dactylon</i> var. <i>aridus</i>	1	10	2,950

Table 1—Weight of Working Sample—Continued

Name of seed	Minimum weight for purity analysis (Grams)	Minimum weight for noxious-weed seed examination (Grams)	Approximate number of seeds per gram (Grams)
Bluegrass:			
Bulbaus— <i>Poa bulbosa</i>	4	40	585
Canada— <i>Poa compressa</i>	½	5	5,050
Glaucaantha— <i>Poa glauca</i>	1	10	.....
Kentucky (all vars.)— <i>Poa pratensis</i>	1	10	3,060
Nevada— <i>Poa nevadensis</i>	1	10	2,305
Rough— <i>Poa trivialis</i>	½	5	4,610
Texas— <i>Poa arachnifera</i>	1	10	2,500
Woad— <i>Poa nemoralis</i>	½	5	4,330
Bluestem:			
Big— <i>Andropogon gerardi</i>	7	70	320
Little— <i>Schizachyrium scoparium</i>	5	50	525
Sand— <i>Andropogon hallii</i>	10	100	215
Yellow— <i>Bothriochloa ischaemum</i>	1	10	1,945
Brome:			
Field— <i>Bromus arvensis</i>	5	50	465
Meadow— <i>Bromus biebersteinii</i>	13	130	19
Mountain— <i>Bromus marginatus</i>	20	200	140
Smaath— <i>Bromus inermis</i>	7	70	315
Braamcarn— <i>Sorghum bicolor</i>	40	400	60
Buckwheat— <i>Fagopyrum esculentum</i>	50	500	45
Buffalagrass— <i>Buchloe dactyloides</i> :			
(Burs)	20	200	110
(Caryapses).....	3	30	740
Buffelgrass— <i>Cenchrus ciliaris</i> :			
(Fascicles)	6	66	365
(Caryapses)	2	20	1,940
Burclover, California— <i>Medicago polymorpha</i> (in bur)	50	500	.....
Burclover, California— <i>Medicago polymorpha</i> (aut of bur).....	7	70	375
Burclover, spatted— <i>Medicago arabica</i> (in bur).....	50	500	50
Burclover, spatted— <i>Medicago arabica</i> (aut of bur).....	5	50	550
Burnet, little— <i>Sanguisorba minor</i>	25	250	110
Buttan clover— <i>Medicago orbicularis</i>	7	70	365
Canarygrass— <i>Phalaris canariensis</i>	20	200	150
Canarygrass, reed— <i>Phalaris arundinacea</i>	2	20	1,185
Carpetgrass— <i>Axonopus affinis</i>	1	10	2,230
Castarbean— <i>Ricinus communis</i>	500	500	5
Chess, soft— <i>Bromus mollis</i>	5	50	555
Chickpea— <i>Cicer arietinum</i>	500	500	2
Claver:			
Alsike— <i>Trifolium hybridum</i>	2	20	1,500
Arrowhead— <i>Trifolium vesiculosum</i>	3	30	90
Berseem— <i>Trifolium alexandrinum</i>	5	50	455
Cluster— <i>Trifolium glomeratum</i>	1	10	2,925
Crimsan— <i>Trifolium incarnatum</i>	10	100	330
Kenya— <i>Trifolium semipilosum</i>	2	20	.....
Ladina— <i>Trifolium repens</i>	2	20	1,935
Lappa— <i>Trifolium lappaceum</i>	2	20	150
Large hop— <i>Trifolium campestre</i>	1	10	5,435
Persian— <i>Trifolium resupinatum</i>	2	20	1,415
Red— <i>Trifolium pratense</i>	5	50	600
Rase— <i>Trifolium hirtum</i>	7	70	360
Small hop (Suckling)— <i>Trifolium dubium</i>	2	20	1,950
Strawberry— <i>Trifolium fragiferum</i>	5	50	635
Sub— <i>Trifolium subterraneum</i>	25	250	120
White— <i>Trifolium repens</i>	2	20	1,500
Corn:			
Field— <i>Zea mays</i>	500	500	3
Pap— <i>Zea mays</i>	500	500	.....
Cattan— <i>Gossypium</i> spp.....	300	500	8
Cowpea— <i>Vigna unguiculata</i> subsp. <i>unguiculata</i>	300	500	8

Table 1—Weight of Working Sample—Continued

Name of seed	Minimum weight for purity analysis (Grams)	Minimum weight for noxious-weed seed examination (Grams)	Approximate number of seeds per gram (Grams)
Crambe— <i>Crambe abyssinica</i>	25	250	.....
Crested dogtail— <i>Cynosurus cristatus</i>	2	20	1,900
Crotalaria:			
Lance— <i>Crotalaria lanceolata</i>	7	70	375
Showy— <i>Crotalaria spectabilis</i>	25	250	80
Slenderleaf— <i>Crotalaria brevidens</i> var. <i>intermedia</i>	10	100	205
Striped— <i>Crotalaria striata</i> (<i>C. pallida</i>)	10	100	215
Sunn— <i>Crotalaria juncea</i>	75	500	35
Crownvetch— <i>Coronilla varia</i>	10	100	305
Dallisgrass— <i>Paspalum dilatatum</i>	4	40	620
Dichandra— <i>Dichondra repens</i>	5	50	470
Dropseed, sand— <i>Sporobolus cryptandrus</i>	1/4	2.5	12,345
Emmer— <i>Triticum dicoccum</i>	100	500	25
Fescue:			
Chewings— <i>Festuca rubra</i> subsp. <i>commutata</i>	3	30	900
Hair— <i>Festuca tenuifolia</i>	1	10	.....
Hard— <i>Festuca longifolia</i>	2	20	1,305
Meadow— <i>Festuca pratensis</i>	5	50	495
Red— <i>Festuca rubra</i> subsp. <i>rubra</i>	3	30	900
Sheep— <i>Festuca ovina</i> var. <i>ovina</i>	2	20	1,165
Tall— <i>Festuca arundinacea</i>	5	50	455
Flax— <i>Linum usitatissimum</i>	15	150	180
Grama:			
Blue— <i>Bouteloua gracilis</i>	6	20	1,595
Side-oats— <i>Bouteloua curtipendula</i>			
(Other than caryopses)	6	60	350
(Caryopses)	2	20	1,605
Guar— <i>Cyamopsis tetragonoloba</i>	75	500	35
Guineagrass— <i>Panicum maximum</i>	2	20	2,205
Hardinggrass— <i>Phalaris stenoptera</i>	3	30	750
Hemp— <i>Cannabis sativa</i>	50	500	45
Indiangrass, yellow— <i>Sorghastrum nutans</i>	7	70	395
Indigo, hairy— <i>Indigofera hirsuta</i>	7	70	435
Japanese lawnglass— <i>Zoysia japonica</i>	2	20	1,325
Johnsongrass— <i>Sorghum halepense</i>	10	100	265
Kudzu— <i>Pueraria lobata</i>	25	250	80
Lentil— <i>Lens culinaris</i>	120	500	14-23
Lespedeza:			
Korean— <i>Lespedeza stipulacea</i>	5	50	525
Sericea or Chinese— <i>Lespedeza cuneata</i> (L. <i>sericea</i>)	3	30	820
Siberian— <i>Lespedeza juncea</i>	3	30	820
Striate (Common, Kabe, Tenn. 76) <i>Lespedeza striata</i>	5	50	750
Lavgrass, sand— <i>Eragrostis trichodes</i>	1	10	3,585
Lavgrass, weeping— <i>Eragrostis curvula</i>	1	10	3,270
Lupine:			
Blue— <i>Lupinus angustifolius</i>	500	500	7
White— <i>Lupinus albus</i>	500	500	7
Yellow— <i>Lupinus luteus</i>	300	500	9
Manilagrass— <i>Zoysia matrella</i>	2	20	.....
Meadow foxtail— <i>Alopecurus pratensis</i>	3	30	893
Medick, black— <i>Medicago lupulina</i>	5	50	585
Milkvetch— <i>Astragalus cicer</i>	10	100	295
Millet:			
Browntop— <i>Brachiaria ramosa</i>	8	80	315
Foxtail, Such as Common, White Wonder, German, Hungarian, Siberian, or Golden— <i>Setaria italica</i>	5	50	480
Japanese— <i>Echinochloa crusgalli</i> var. <i>frumentacea</i>	9	90	315
Pearl— <i>Pennisetum americanum</i>	15	150	180
Proso— <i>Panicum miliaceum</i>	15	150	185
Mallassesgrass— <i>Melinis minutiflora</i>	1/2	5	7,750
Mustard:			
Black— <i>Brassica nigra</i>	2	20	1,255

Table 1—Weight of Working Sample—Continued

Name of seed	Minimum weight for purity analysis (Grams)	Minimum weight for noxious-weed seed examination (Grams)	Approximate number of seeds per gram (Grams)
Indio— <i>Brassica juncea</i>	5	50	624
White— <i>Sinapis alba</i>	15	150	160
Napiergrass— <i>Pennisetum purpureum</i>	5	50	.....
Oat— <i>Avena</i> spp.....	75	500	35-50
Oatgrass, toll— <i>Arrhenatherum elatius</i>	6	60	415
Orchardgrass— <i>Dactylis glomerata</i>	3	30	945
Panicgrass, blue— <i>Panicum antidotale</i>	2	20	1,370
Panicgrass, green— <i>Panicum maximum</i> var. <i>trichoglume</i>	2	20	1,305
Peanut— <i>Arachis hypogaea</i>	500	500	1-3
Pea, field— <i>Pisum sativum</i> var. <i>arvense</i>	500	500	4
Rape:			
Annual— <i>Brassica napus</i> var. <i>annua</i>	7	70	345
Bird— <i>Brassica rapa</i>	7	70	425
Turnip— <i>Brassica rapa</i>	5	50	535
Winter— <i>Brassica napus</i> var. <i>biennis</i>	10	100	230
Redtop— <i>Agrostis gigantea</i>	1/4	2.5	10,695
Rescuegrass— <i>Bromus unioloides</i>	20	200	115
Rhodesgrass— <i>Chloris gayana</i>	1	10	4,725
Rice— <i>Oryza sativa</i>	50	500	65
Ricegrass, Indion— <i>Oryzopsis hymenoides</i>	7	70	355
Roughpeo— <i>Lathyrus hirsutus</i>	75	500	40
Rye— <i>Secale cereale</i>	75	500	40
Ryegrass:			
Annual (Italian)— <i>Lolium multiflorum</i>	5	50	420
Perennial— <i>Lolium perenne</i>	5	50	530
Wimmero— <i>Lolium rigidum</i>	5	50	.....
Safflower— <i>Carthamus tinctorius</i>	100	500	30
Saltbush, fourwing— <i>Atriplex canescens</i>	15	150	165
Sainfoin— <i>Onobrychis viciifolia</i>	50	500	50
Sesame— <i>Sesamum indicum</i>	7	70	360
Sesbania— <i>Sesbania exaltata</i>	25	250	105
Smilo— <i>Oryzopsis miliacea</i>	2	20	2,010
Sorghum— <i>Sorghum bicolor</i>	50	500	55
Sorghum olmum— <i>Sorghum alnum</i>	15	150	150
Sorghum—sudongross <i>Sorghum bicolor</i> \times <i>Sorghum sudanense</i>	50	500	55
Sorgross ¹	15	150	135
Sourclover— <i>Melilotus indica</i>	5	50	660
Soybean— <i>Glycine max</i>	500	500	6-13
Spelt— <i>Triticum spelta</i>	100	500	25
Sudongross— <i>Sorghum sudanense</i>	25	250	100
Sunflower (Cult.)— <i>Helianthus annuus</i>	100	500	.....
Sweetclover:			
White— <i>Melilotus alba</i>	5	50	570
Yellow— <i>Melilotus officinalis</i>	5	50	570
Sweet vernalgrass— <i>Anthoxanthum odoratum</i>	2	20	1,600
Switchgrass— <i>Panicum virgatum</i>	4	40	57
Timothy— <i>Phleum pratense</i>	1	10	2,565
Timothy, turf— <i>Phleum nodosum</i>	1	10	2,565
Tobacco— <i>Nicotiana tabacum</i>	1/2	5	15,625
Trefoil:			
Big— <i>Lotus uliginosus</i> (<i>L. major</i>)	2	20	1,945
Birdsfoot— <i>Lotus corniculatus</i>	3	30	815
Triticole— \times <i>Triticosecale</i>	100	500	.....
Voseygrass— <i>Paspalum urvillei</i>	3	30	970
Veldtgrass— <i>Ehrharta calycina</i>	4	40	655
Velvetbean— <i>Mucuna deeringiana</i>	500	500	2
Velvetgrass— <i>Holcus lanatus</i>	1	10	3,360
Vetch:			
Common— <i>Vicia sativa</i> subsp. <i>sativa</i>	150	500	19
Hairy— <i>Vicia villosa</i>	75	500	35
Hungarian— <i>Vicia pannonica</i>	100	500	24

Table 1—Weight of Working Sample—Continued

Name of seed	Minimum weight for purity analysis (Grams)	Minimum weight for noxious-weed seed examination (Grams)	Approximate number of seeds per gram (Grams)
Manantha— <i>Vicia articulata</i> (<i>V. monantha</i>).....	100	500	.....
Narrowleaf— <i>Vicia sativa</i> subsp. <i>nigra</i>	50	500	60
Purple— <i>Vicia benghalensis</i>	100	500	22
Waallypad— <i>Vicia villosa</i> subsp. <i>varia</i>	100	500	25
Wheat:			
Camman— <i>Triticum aestivum</i>	100	500	25
Club— <i>Triticum compactum</i>	100	500	25
Durum— <i>Triticum durum</i>	100	500	25
Palish— <i>Triticum palonicum</i>	100	500	25
Paulard— <i>Triticum turgidum</i>	100	500	25
Wheat X Agraricum— <i>Triticum X Agrotriticum</i>	65	500	38
Wheatgrass:			
Beardless— <i>Agropyron spicatum</i> f. <i>inerme</i>	8	80	275
Fairway crested— <i>Agropyron cristatum</i>	4	40	685
Standard crested— <i>Agropyron desertorum</i>	5	50	425
Intermediate— <i>Agropyron intermedium</i>	15	150	175
Pubescent— <i>Agropyron intermedium</i> var. <i>trichophorum</i>	15	150	180
Siberian— <i>Agropyron sibiricum</i>	10	50	.....
Slender— <i>Agropyron trachycaulum</i>	7	70	295
Streambank— <i>Agropyron riparium</i>	10	50	370
Tall— <i>Agropyron elongatum</i>	15	150	165
Western— <i>Agropyron smithii</i>	10	100	250
Wildrye:			
Canada— <i>Elymus canadensis</i>	11	110	190
Russian— <i>Elymus junceus</i>	6	60	360
vegetable seed			
Artichake— <i>Cynara scolymus</i>	100	500	24
Asparagus— <i>Asparagus officinalis</i>	100	500	25
Asparagusbean— <i>Vigna unguiculata</i> subsp. <i>sesquipedalis</i>	300	500	8
Bean:			
Garden— <i>Phaseolus vulgaris</i>	500	500	4
Lima— <i>Phaseolus lunatus</i>	500	500	2
Runner— <i>Phaseolus coccineus</i>	500	500	1
Beet— <i>Beta vulgaris</i> var. <i>vulgaris</i>	50	300	60
Bradbean— <i>Vicia faba</i>	500	500	.....
Braccali— <i>Brassica oleracea</i> var. <i>botrytis</i>	10	50	315
Brussels sprouts— <i>Brassica oleracea</i> var. <i>gemmifera</i>	10	50	315
Burdock, great— <i>Arctium lappa</i>	15	150	.....
Cabbage— <i>Brassica oleracea</i> var. <i>capitata</i>	10	50	315
Cabbage, Chinese (Petsai)— <i>Brassica pekinensis</i>	5	50	635
Cabbage, tranchuda— <i>Brassica oleracea</i> var. <i>tronchuda</i>	10	100	.....
Cardaan— <i>Cynara cardunculus</i>	100	500	.....
Carrat— <i>Daucus carota</i>	3	50	825
Cauliflower— <i>Brassica oleracea</i> var. <i>botrytis</i>	10	50	315
Celeriac— <i>Apium graveolens</i> var. <i>rapaceum</i>	1	25	2,520
Celery— <i>Apium graveolens</i> var. <i>dulce</i>	1	25	2,520
Chard, Swiss— <i>Beta vulgaris</i> var. <i>cicla</i>	50	300	60
Chicory— <i>Cichorium intybus</i>	3	50	940
Chives— <i>Allium schaenoprasum</i>	5	50	.....
Citran— <i>Citrullus lanatus</i> var. <i>citraides</i>	200	500	11
Callards— <i>Brassica oleracea</i> var. <i>acephala</i>	10	50	315
Corn, sweet— <i>Zea mays</i>	500	500	.....
Carnsalad— <i>Valerianella lacusta</i> :			
Vars. Fullhearted and Dark Green Fullhearted.....	5	50	.....
All other varieties	10	50	380
Cowpea— <i>Vigna unguiculata</i> subsp. <i>unguiculata</i>	300	500	8
Cress:			
Garden— <i>Lepidium sativum</i>	5	50	425
Upland— <i>Barbara verna</i>	2	35	1,160
Water— <i>Nasturtium officinale</i>	1	25	5,170
Cucumber— <i>Cucumis sativus</i>	75	500	40

Table 1—Weight of Working Sample—Continued

Name of seed	Minimum weight for purity analysis (Grams)	Minimum weight for noxious-weed seed examination (Grams)	Approximate number of seeds per gram (Grams)
Dandelion— <i>Taraxacum officinale</i>	2	35	1,240
Eggplant— <i>Solanum melongena</i>	10	50	230
Endive— <i>Cichorium endivia</i>	3	50	940
Gherkin, West India— <i>Cucumis anguria</i>	16	160	153
Kale— <i>Brassica oleracea</i> var. <i>acephala</i>	10	50	315
Kale, Chinese— <i>Brassica oleracea</i> var. <i>albaglabra</i>	10	50	.....
Siberian— <i>Brassica napus</i> var. <i>pabularia</i>	10	50	.....
Kohlrabi— <i>Brassica oleracea</i> var. <i>gongylodes</i>	10	50	315
Leek— <i>Allium ampeloprasum</i>	7	50	395
Lettuce— <i>Lactuca sativa</i>	3	50	890
Musk-melon (cantaloupe)— <i>Cucumis melo</i>	50	500	45
Mustard, India— <i>Brassica juncea</i>	5	50	625
Mustard, spinach— <i>Brassica perviridis</i>	5	50	535
Okra— <i>Abelmoschus esculentus</i> (<i>Hibiscus esculentus</i>)	100	500	19
Onion— <i>Allium cepa</i>	7	50	340
Onion, Welsh— <i>Allium fistulosum</i>	10	50	.....
Pak-chai— <i>Brassica chinensis</i>	5	50	635
Parsley— <i>Petroselinum crispum</i>	5	50	650
Parsnip— <i>Pastinaca sativa</i>	5	50	430
Pea— <i>Pisum sativum</i>	500	500	3
Pepper— <i>Capsicum spp</i>	15	150	165
Pumpkin— <i>Cucurbita pepo</i>	500	500	5
Radish— <i>Raphanus sativus</i>	30	300	75
Rhubarb— <i>Rheum rhabarbarum</i>	50	300	60
Rutabaga— <i>Brassica napus</i> var. <i>napabrassica</i>	5	50	430
Salsify— <i>Tragopogon porrifolius</i>	50	300	65
Sarrel— <i>Rumex acetosa</i>	2	35	1,080
Saybean— <i>Glycine max</i>	500	500	6-13
Spinach— <i>Spinacia oleracea</i>	25	150	100
Spinach, New Zealand— <i>Tetragonia tetragonioides</i>	200	500	13
Squash— <i>Cucurbita maxima</i> and <i>C. moschata</i>	200	500	14
Tamata— <i>Lycopersicon esculentum</i>	5	50	405
Tamata, husk— <i>Physalis pubescens</i>	2	35	1,240
Turnip— <i>Brassica rapa</i>	5	50	535
Watermelon— <i>Citrullus lanatus</i>	200	500	11

¹ Rhizomatous derivatives of a johnsongrass \times sorghum cross or a johnsongrass \times sudangrass cross.

[25 FR 8769, Sept. 13, 1960, and 30 FR 7888, June 18, 1965, as amended at 32 FR 12780, Sept. 6, 1967; 35 FR 6108, Apr. 15, 1970; 38 FR 12730, May 15, 1973; 41 FR 20156, May 17, 1976; 46 FR 53635, Oct. 29, 1981]

§ 201.47 Separation.

(a) The working sample shall be weighed in grams to four significant figures and shall then be separated into four parts: (1) Kind or variety to be considered pure seed, (2) other crop seed, (3) weed seed, and (4) inert matter. The components shall be weighed in grams to the same number of decimal places as the working sample. The percentage of each part shall be determined to two decimal places.

(b) Aids for the classification of pure seed, other crop seed, weed seed, and inert matter may include visual examination, use of transmitted light (diaphanoscope), or specific gravity (seed blowers). Specific instructions for classification of the various components

are given in §§ 201.47a to 201.51, inclusive.

(c) The components shall be weighed and percentages calculated as follows:

(1) For sample sizes less than 25 grams, all four components shall be weighed; the percentages shall be based on the sum of these weights and not on the original weight. The sum of these weights shall be compared with the original weight of the working sample as a check against the loss of material, or other errors.

(2) For sample sizes of 25 grams or more, the components—other crop seed, weed seed, and inert matter—shall be weighed separately and their percentages determined by dividing these weights by the original weight of the working sample. The pure seed need not be weighed; its percentage may be determined by subtracting the sum of the percentages of the other three components from 100.

(d) When the working sample consists of two or more similar kinds or varieties which would be difficult to

separate in the entire sample, it is permissible to weigh the similar kinds or varieties together as one component and make the separation on a reduced portion of the sample. At least 400 seeds or an equivalent weight shall be taken indiscriminately from the pure seed component and the separation made on this portion. The proportion of each kind present shall then be determined by weight and from this the percentage in the entire sample shall be calculated.

(e) The Uniform Blowing Procedure described in § 201.51a(a) shall be used for the separation of pure seed and inert matter in seeds of Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*P. compressa*), rough bluegrass (*P. trivialis*), "Pensacola" variety of bahiagrass (*Paspalum notatum*), and orchardgrass (*Dactylis glomerata*).

[25 FR 8770, Sept. 13, 1960, as amended at 30 FR 7890, June 18, 1965; 46 FR 53635, Oct. 29, 1981]

§ 201.47a Seed unit.

The seed unit is the structure usually regarded as a seed in planting practices and in commercial channels. The seed unit may consist of one or more of the following structures:

- (a) True seeds;
- (b) For the grass family:
 - (1) Caryopses and single florets;
 - (2) Multiple florets and spikelets in tall oatgrass (*Arrhenatherum elatius*), oat (*Avena* spp.), gramas (*Bouteloua* spp.), Rhodes grass (*Chloris gayana*), barley (*Hordeum vulgare*), and bluegrass (*Poa* spp.);
 - (3) Entire spikelets in *Agrostis* (*Agrostis* spp.), *Panicum* (*Panicum* spp.), and foxtail millet (*Setaria italica*). Entire spikelets which may have attached rachis segments, pedicels, and sterile spikelets in bluestems (*Andropogon* spp., *Bothriochloa ischaemum* and *Schizachyrium scoparium*), *Sorghum* (*Sorghum* spp.), and yellow indiangrass (*Sorghastrum nutans*);
 - (4) Spikelet groups that disarticulate as units with attached rachis and internodes in bluestems (*Andropogon* spp., *Bothriochloa ischaemum* and *Schizachyrium scoparium*), side-oats grama (*Bouteloua curtipendula*), and yellow indiangrass (*Sorghastrum nutans*);
 - (5) Fascicles of buffelgrass (*Cenchrus ciliaris*) consisting of bristles and spikelets;
 - (6) Burs of buffalograss (*Buchloe dactyloides*);
 - (7) Bulblets of bulbous bluegrass (*Poa bulbosa*);
 - (8) Multiple units as defined in § 201.51a(b)(1).
- (c) Dry indehiscent fruits in the following plant families: Buckwheat (*Polygonaceae*), sunflower (*Compositae*), geranium (*Geraniaceae*), goosefoot (*Chenopodiaceae*), and valerian (*Valerianaceae*);
- (d) One- and two-seeded pods of small-seeded legumes (*Leguminosae*), burs of the burclovers (*Medicago arabica*, *M. polymorpha*), and pods of peanuts (*Arachis hypogaea*). (This does not preclude the shelling of small-seeded legumes for purposes of identification.) Pods of legumes normally containing more than two seeds, when occurring incidentally in the working sample, should be hulled if the kind is hulled when marketed;
- (e) Fruits or half fruits in the carrot family (*Umbelliferae*);
- (f) Nutlets in the following plant families: Borage (*Boraginaceae*), mint (*Labiatae*), and vervain (*Verbenaceae*);
- (g) "Seed balls" or portions thereof in multigerm beets (*Beta vulgaris*), and fruits with accessory structures such as occur in New Zealand spinach (*Tetragonia tetragonoides*).

[46 FR 53636, Oct. 29, 1981]

§ 201.47b Working samples.

The purity working sample is the sample on which the purity analysis is

made. The noxious-weed seed working sample is the sample on which the noxious-weed seed examination is made.

[20 FR 7930, Oct. 21, 1955]

§ 201.48 Kind or variety considered pure seed.

The pure seed shall include all seeds of each kind or each kind and variety under consideration present in excess of 5 percent of the whole. Seeds of kinds or kinds and varieties present to the extent of 5 percent or less of the whole may be considered pure seed if shown on the label as components of a mixture in amounts of 5 percent or less. The following shall be included with the pure seed:

(a) Immature or shriveled seeds and seeds that are cracked or injured. For seeds of legumes (*Leguminosae*) and crucifers (*Cruciferae*) with the seed coats entirely removed refer to § 201.51(a)(1);

(b) Pieces of seeds which are larger than one-half of the original size. For separated cotyledons of legume seeds refer to § 201.51(a)(2);

(c) Insect-damaged seeds, provided that the damage is entirely internal, or that the opening in the seed coat is not sufficiently large so as to allow the size of the remaining mass of tissue to be readily determined. Weevil-infested vetch seeds, irrespective of the amount of insect damage, are to be considered pure seed, unless they are broken pieces one-half or less than the original size. For classification of broken pieces of seed units one-half or less than the original size, refer to § 201.51(a)(2). Refer to § 201.51(a)(3) for chalcid-damaged seeds;

(d) Seeds that have started to germinate;

(e) Seeds of the cucurbit family (*Cucurbitaceae*) and the nightshade family (*Solanaceae*) whether they are filled or empty;

(f) Intact fruits, whether or not they contain seed, of species belonging to the following families: Sunflower (*Compositae*), buckwheat (*Polygonaceae*), carrot (*Umbelliferae*), valerian (*Valerianaceae*), mint (*Labiatae*) and other families in which the seed unit may be a dry, indehiscent one-seeded fruit. For visibly empty fruits, refer to inert matter, § 201.51(a)(6);

(g) Seed units of the grass family listed in § 201.47a(b) (1) through (5) if a caryopsis with some degree of endosperm development can be detected in the units, either by slight pressure or by examination over light. Species in which determination of endosperm development is not necessary are listed in paragraphs (g) (1) and (2) of this section. Refer to §§ 201.48(h) and 201.51(a)(5) when nematode galls and fungal bodies have replaced the caryopsis in seed units. The following procedures apply to determine pure seed in the grass families listed below:

(1) Intact burs of buffalograss (*Buchloe dactyloides*) shall be considered pure seed whether or not a caryopsis is present. Refer to § 201.51(a)(6) for burs which are visibly empty.

(2) The Uniform Blowing Procedure described in § 201.51a(a) shall be used to determine classification of florets into pure seed or inert matter for Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*P. compressa*), rough bluegrass (*P. trivialis*), Pensacola bahiagrass (*Paspalum notatum*) and orchardgrass (*Dactylis glomerata*).

(3) Special purity procedures for Chewings fescue (*Festuca rubra* subsp. *commutata*), red fescue (*F. rubra*), orchardgrass (*Dactylis glomerata*), crested wheatgrass (*Agropyron cristatum* or *A. desertorum*), pubescent wheatgrass (*A. intermedium* var. *trichophorum*), intermediate wheatgrass (*A. intermedium*), and smooth brome (*Bromus inermis*), are listed in § 201.51a(b).

(4) For methods of determining pure seed percentages of annual and perennial ryegrass, refer to §§ 201.58(b)(10) and 201.58a(a).

(h) Seed units with nematode galls, fungal bodies (i.e. ergot, other sclerotinia and smut) and spongy or corky caryopses which are entirely enclosed within the seed unit. Refer to § 201.51(c)(1) for inert matter classification, and to § 201.51(a)(5) for dallisgrass (*Paspalum dilatatum*) and bahiagrass (*Paspalum notatum*) as inert matter.

(i) Seed units of beets (*Beta vulgaris*) and New Zealand spinach (*Tetragonia tetragonoides*). Refer to §§ 201.47a(g) and 201.51(a)(6) for definitions of seed units and inert matter, respectively.

[46 FR 53636, Oct. 29, 1981]

§ 201.49 Other crop seed.

Seeds of plants grown as crops (other than the kind or variety included in the pure seed) shall be considered other crop seeds, unless recognized as weed seeds by applicable laws, or regulations, or by general usage. All interpretations and definitions for "pure seed" in § 201.48 shall also apply in determining whether seeds are other crop seed or inert matter.

[20 FR 7930, Oct. 21, 1955]

§ 201.50 Weed seed.

Seeds (including bulblets or tubers) of plants shall be considered weed seeds when recognized as weed seeds by the law or rules and regulations of the State into which the seed is offered for transportation or transported; or by the law or rules and regulations of Puerto Rico, Guam, or District of Columbia into which transported, or District of Columbia in which sold; or found by the Secretary of Agriculture to be detrimental to the agricultural interests of the United

States, or any part thereof. Damaged weed seeds and immature seedlike structures, as described in § 201.51(b), shall be considered inert matter. Weed seeds, as defined above in this section, requiring further separation into weed seed and inert matter components are as follows:

(a) Capsules and clusters of seeds of poverty rush (*Juncus tenuis*), and other species of rush (*Juncus* spp.) having seeds of similar size, are classed as weed seeds. For the classification of individual seeds of rush (*Juncus* spp.) refer to § 201.51(b)(9);

(b) For species having seeds larger than rush (*Juncus* spp.), the individual seeds are to be removed from fruiting structures such as pods and heads. The seeds are classified as weed seed and the remaining fruiting structures classified as inert matter.

(c) Wild onion and wild garlic (*Allium* spp.) bulblets which have any part of the husk remaining and are not damaged at the basal end are considered weed seeds regardless of size. For wild onion and wild garlic (*Allium* spp.) bulblets classed as inert matter refer to § 201.51(b)(5).

[46 FR 53636, Oct. 29, 1981]

§ 201.51 Inert matter.

Inert matter shall include seeds and seed-like structures from both crop and weed plants and other material not seeds as follows:

(a) Seeds and seed-like structures from crop plants:

(1) Seeds of legumes (Leguminosae) and crucifers (Cruciferae) with the seed coats entirely removed. Refer to § 210.48(a) for pure seed classification.

(2) Pieces of broken and damaged seed units, including those that are insect damaged, which are one-half the original size or less. If greater than one-half, refer to § 201.48(b) and (c) for pure seed classification. Also included as inert matter are separated cotyledons of legumes, irrespective of whether or not the radicle-plumule axis and/or more than one-half of the seed coat may be attached.

(3) Chalcid-damaged seeds (puffy, soft, or dry and crumbly) of alfalfa, red clover, crimson clover, and similar kinds of small seeded legumes. Refer to § 201.48(c) for pure seed classification.

(4) Glumes and empty florets except as stated under pure seed. Refer to § 201.48 (g) and (h) for pure seed classification.

(5) Seed units with nematode galls or fungal bodies (smut, ergot, and other sclerotia) protruding from the tip of the seed unit. Also included are ergot and smut diseased caryopsis of dallisgrass (*Paspalum dilatatum*) and bahiagrass (*Paspalum notatum*) which are entirely enclosed within the seed unit. Refer to § 201.48(h) for pure seed classification.

(6) Fruit portions or fragments of monogerm beets (*Beta vulgaris*), New

Zealand spinach (*Tetragonia tetragonoides*), buffalograss (*Buchloe dactyloides*) and families in which the seed unit is a dry indehiscent one-seeded fruit which visibly does not contain a seed. Refer to § 201.48 (f), (g)(1), and (i) for pure seed classification.

(b) Seeds and seed-like structures from weed plants, which by visual examination (including the use of light or dissection), can be determined to be within the following categories:

(1) Damaged seed (other than grasses) with over one-half of the embryo missing.

(2) Grass florets and caryopsis classed as inert:

(i) Glumes and empty florets of weedy grasses;

(ii) Damaged grass caryopsis, including free caryopsis, with over one-half the root-shoot axis missing (the scutellum excluded);

(iii) Immature free caryopsis devoid of embryo and/or endosperm;

(iv) Immature florets of quackgrass (*Agropyron repens*) in which the caryopsis are less than one-third the length of the palea. The caryopsis is measured from the base of the rachilla;

(v) Free caryopsis of quackgrass (*A. repens*) that are 2 mm or less in length.

(3) Seeds of legumes and species of *Brassica* with the seed coats entirely removed.

(4) Immature seed units, devoid of both embryo and endosperm, such as occur in but not limited to the following plant families: Sedge (Cyperaceae), buckwheat (Polygonaceae), morning glory (Convolvulaceae), nightshade (Solanaceae), puncturevine (Zygophyllaceae) and sunflower (Compositae). Cocklebur (*Xanthium* spp.) burs are to be dissected to determine whether or not seeds are present.

(5) Wild onion and wild garlic (*Allium* spp.) bulblets:

(i) Bulbels which are completely devoid of the husk and pass through a 1/13th-inch, round-hole sieve.

(ii) Bulbels which show evident damage to the basal end, whether husk is present or absent. Refer to § 201.50(c) for wild onion and wild garlic (*Allium* spp.) bulblets classed as weed seeds.

(6) Dodder (*Cuscuta* spp.): Seeds devoid of embryos and seeds which are ashy gray to creamy white in color are inert matter. Seeds should be sectioned when necessary to determine if an embryo is present as when seeds have a normal color but are slightly swollen, dimpled or have minute holes.

(7) Buckhorn (*Plantago lanceolata*): Black seeds, with no brown color evident, whether shriveled or plump; the color of questionable seeds shall be determined by use of a stereoscopic microscope with magnification of approximately 10 \times and a fluorescent lamp with two 15-watt daylight-type tubes.

(8) Ragweed (*Ambrosia* spp.): Seed with both the involucre and pericarp absent.

(9) Individual seeds of *Juncus* species shall be left in the inert matter and their presence recorded under "weed seeds."

(c) Other matter that is not seed:

(1) Free nematode galls or fungal bodies such as smut, ergot, and other sclerotia.

(2) Soil particles, sand, stone, chaff, stems, leaves, flowers, and any other foreign material.

[46 FR 53637, Oct. 29, 1981; 46 FR 58059, Nov. 30, 1981]

§ 201.51a Special procedures for purity analysis.

(a) The Uniform Blowing Procedure shall be used for the separation of pure seed and inert matter in the following: Kentucky bluegrass (*Poa pratensis*); Canada bluegrass (*P. compressa*); rough bluegrass (*P. trivialis*); Pensacola variety of bahiagrass (*Paspalum notatum*) and orchardgrass (*Dactylis glomerata*). When kinds listed in this section appear in mixtures they shall be separated from other kinds before using the uniform blowing procedure. To determine the blowing point for these procedures, individual calibration samples for Kentucky bluegrass, orchardgrass, and Pensacola variety of bahiagrass shall be used. The calibration sample for Kentucky bluegrass shall be used for Canada bluegrass and rough bluegrass. The blowing point for Canada bluegrass shall be the same as the blowing point determined for Kentucky bluegrass. The blowing point for rough bluegrass shall be a factor of 0.82 (82 percent) of the blowing point determined for Kentucky bluegrass. Calibration samples and instructions are available through the Seed Branch, AMS, Livestock and Seed Division, USDA, Bldg. 306, Room 213, Beltsville, Maryland 20705. The calibration samples shall be used to establish a blowing point prior to proceeding with the separation of pure seed and inert matter for these kinds. After completing the blowing procedure, remove all weed and crop seeds from the light portion and add these to the weed or crop separation, as appropriate. The remainder of the light portion shall be considered inert matter. Remove all weed and crop seeds and other inert matter (stems, leaves, dirt) from the heavy portion and add these to the weed, crop or inert matter separations, as appropriate. The remainder of the heavy portion shall be considered pure seed. With orchardgrass, after the blowing, proceed with the multiple unit procedure.

(b) The Multiple Unit Procedure of determining the pure seed fraction shall be used for the kinds included in the following table when multiple units are present in a sample.

(1) A multiple unit is a seed unit that includes at least one fertile floret plus one or more of attached structures as follows (the length of an awn shall be disregarded when determining the length of a fertile floret or an attached structure):

(i) A sterile floret that extends to or beyond the tip of the fertile floret;

(ii) Basally attached glume, glumes, or sterile florets of any length.

(2) Procedure for determination of multiple seed units:

(i) For a single kind: determine the percentage of single florets present, based on the total weight of single florets and multiple units. Apply the

appropriate factor, as determined from the following table, to the weight of the multiple units and add that portion of the multiple unit weight to the weight of the single units. The remaining multiple unit weight shall be added to the weight of the inert matter.

(ii) For mixtures that include one or more of the kinds in the following table, determine the percentage of single florets, based on the total weight of single florets and multiple units, for each kind. Apply the appropriate factor, as determined from the following table, to the weight of multiple units of each kind.

present to the extent of 15 percent or less may be used in lieu of 400, in which case an additional 2 percent is to be added to the regular germination tolerances. The seeds shall be tested in replicate tests of 100 seeds or less.

[15 FR 2395, Apr. 28, 1950]

§ 201.55 Retests.

Retests shall be made as follows:

(a) When the range of 100-seed replicates of a given test exceeds the maximum tolerated range in the table appearing in this section.

Table of Maximum Tolerated Ranges Between 100-Seed Replicates for Use in Connection With § 201.55(a)

Percent of single florets of each kind	Factors Applicable to Multiple Units ¹						
	Kind of seed (percent)						
	Chewings fescue	Red fescue	Orchard-grass	Crested wheat-grass ²	Pubescent wheat-grass	Intermediate wheat-grass	Smooth brome
50 or below	91	80	80	70	66	72	72
50.01 to 55.00	91	81	81	72	67	74	74
55.01 to 60.00	91	82	81	73	67	75	75
60.01 to 65.00	91	83	82	74	67	76	76
65.01 to 70.00	91	84	82	75	68	77	78
70.01 to 75.00	91	86	82	76	68	78	79
75.01 to 80.00	91	87	83	77	69	79	81
80.01 to 85.00	91	88	83	78	69	80	82
85.01 to 90.00	91	89	83	79	69	81	83
90.01 to 100.00	91	90	84	79	70	82	85

¹ These factors represent the percentages of the multiple unit weights which are considered pure seed. The remaining percentage is regarded as inert matter.

² Includes both fairway crested wheatgrass (*Agropyron cristatum*) and standard crested wheatgrass (*A. desertorum*).

[46 FR 53637, Oct. 29, 1981]

§ 201.52 Noxious-weed seeds.

The determination of the number of seeds, bulblets, or tubers of individual noxious weeds present per unit weight should be made on at least the minimum quantities listed in § 201.46 Table 1: *Provided*, That if the following indicated numbers of a single kind of seed, bulblet, or tuber are found in the pure-seed analysis (or noxious-weed seed examination of a like amount) the occurrence of that species in the remainder of the bulk examined for noxious-weed seeds need not be noted: ½-gram purity working sample, 16 or more seeds; 1-gram purity working sample, 23 or more seeds; 2-gram purity working sample or larger, 30 or more seeds. The seeds per unit weight shall be based on the number of single seeds. The number of individual seeds shall be determined in burs of sandbur (*Cenchrus* spp.) and cocklebur (*Xanthium* spp.), capsules of dodder (*Cuscuta* spp.), berries of horse nettle and nightshade (*Solanaceae*) and in the fruits of other noxious weeds that contain more than one seed. Refer to §§ 201.50 and 201.51(b)(4) for the classification of weed seeds and inert matter, respectively.

[20 FR 7931, Oct. 21, 1955, as amended at 25 FR 8771, Sept. 13, 1960; 46 FR 53638, Oct. 29, 1981]

GERMINATION TESTS IN THE ADMINISTRATION OF THE ACT

§ 201.53 Source of seeds for germination.

(a) When both purity and germination tests are required, seeds for germination shall be taken from the separation of the kind, variety, or type considered pure seed and shall be counted without discrimination as to size or appearance.

(b) When only a germination test is required and the pure seed is estimated or determined to be at least 98 percent, the pure seed for the germination test may be taken indiscriminately from a representative portion of the bulk.

(c) When only a germination test is required and the pure seed is found to be less than 98 percent, the seed for the test shall be obtained by separating the sample into two components as follows: (1) Pure seed and (2) other crop seed, weed seed, and inert matter. In making this separation at least ¼ of the quantity required for a regular purity analysis shall be used. The whole sample must be well mixed and divided in such a manner as to get a completely representative subsample.

[10 FR 9952, Aug. 11, 1945, as amended at 20 FR 7931, Oct. 21, 1955]

§ 201.54 Number of seeds for germination.

At least 400 seeds shall be tested for germination except that in mixtures 200 seeds of each of those kinds

(b) When at the time of the prescribed final count there are indications, such as presence of firm ungerminated seeds, that a satisfactory germination has not been obtained;

(c) When there is evidence that the results may not be reliable due to improper test conditions, errors in seedling evaluation, the presence of fungi or bacteria, or inaccuracies in counting or recording results;

(d) When a sample shows seedling injury or abnormality as a result of

	Average percent germinations			Maximum allowed between replicates		
	4 replicates	3 replicates	2 replicates			
99.....	2	5	.....	.....	.....	.....
98.....	3	6	5	.....	.....	.....
97.....	4	7	6	.....	.....	6
96.....	5	8	7	.....	.....	6
95.....	6	9	8	.....	.....	7
94.....	7	10	9	.....	.....	8
93.....	8	10	9	.....	.....	8
92.....	9	11	10	.....	.....	9
91.....	10	11	10	.....	.....	9
90.....	11	12	11	.....	.....	9
89.....	12	12	11	.....	.....	10
88.....	13	13	12	.....	.....	10
87.....	14	13	12	.....	.....	11
86.....	15	14	13	.....	.....	11
85.....	16	14	13	.....	.....	11
84.....	17	14	13	.....	.....	11
83.....	18	15	14	.....	.....	12
82.....	19	15	14	.....	.....	12
81.....	20	15	14	.....	.....	12
80.....	21	16	15	.....	.....	13
79.....	22	16	15	.....	.....	13
78.....	23	16	15	.....	.....	13
77.....	24	17	15	.....	.....	13
76.....	25	17	16	.....	.....	13
75.....	26	17	16	.....	.....	14
74.....	27	17	16	.....	.....	14
73.....	28	17	16	.....	.....	14
72.....	29	18	16	.....	.....	14
71.....	30	18	16	.....	.....	14
70.....	31	18	17	.....	.....	14
69.....	32	18	17	.....	.....	14
68.....	33	18	17	.....	.....	15
67.....	34	18	17	.....	.....	15
66.....	35	19	17	.....	.....	15
65.....	36	19	17	.....	.....	15
64.....	37	19	17	.....	.....	15
63.....	38	19	18	.....	.....	15
62.....	39	19	18	.....	.....	15
61.....	40	19	18	.....	.....	15
60.....	41	19	18	.....	.....	15
59.....	42	19	18	.....	.....	15
58.....	43	19	18	.....	.....	15
57.....	44	19	18	.....	.....	15
56.....	45	19	18	.....	.....	15
55.....	46	20	18	.....	.....	15
54.....	47	20	18	.....	.....	16
53.....	48	20	18	.....	.....	16
52.....	49	20	18	.....	.....	16
51.....	50	20	18	.....	.....	16

chemical treatment, of exposure to chemicals, or of toxicity from any source. (Retest shall be made in soil or a mixture of soil and sand);

(e) When no two satisfactory tests are within tolerance.

EXPLANATORY NOTE: To find the maximum tolerated range, compute the average percentage of all 100-seed replicates of a given test, rounding off the result to the nearest whole number. The germination is found in the first two columns of the table. When the differences between highest and lowest replicates do not exceed the corresponding values found in the "4-replicate" column, no additional testing is required. If the differences exceed these values, omit the lowest replicate and compute the average of the three remaining replicates. If the range between the highest and lowest three replicates do not exceed the values in the "3-replicate" column for the new average percentage germination, retesting is not required and the average of the three replicates shall be regarded as the percentage germination. However, if the differences exceed the values in the "3-replicate" column, retesting is necessary.

When only 200 seeds are tested, retest if the range of the two replicates exceeds the values in the "2-replicate" column. In order to form 100-seed replicates, combine sub-replicates of 25 or 50 seeds which were closest together in the germinator.

[25 FR 8771, Sept. 13, 1960]

§ 201.55a Moisture and aeration of substratum.

(a) The substratum must be moist enough to supply the needed moisture to the seeds at all times. Excessive moisture which will restrict aeration of the seeds should be avoided. Except as provided for those kinds of seeds requiring high moisture levels of the germination media, the substrata should never be so wet that a film of water is formed around the seeds. For most kinds of seeds blotters or other paper substrata should not be so wet that by pressing, a film of water forms around the finger.

(b) The following formula may be used as a guide in the preparation of sand for germination tests:

[118.3 cc. (1 gill) sand/Its weight in grams] $\times 20.2 - 8.0$ = The number of cc. of water to add to each 100 grams of air-dry sand.

(c) The amount of water provided by this formula is satisfactory for seeds the size of clovers and will have to be modified slightly, depending on the kind of seed being tested and the kind of sand used. For example, slightly more moisture should be added when the larger seeds are to be tested.

(d) In preparing soil tests water should be added to the soil until it can be formed into a ball when squeezed in the palm of the hand but will break freely when pressed between two fingers. After the soil has been moistened it should be rubbed through a sieve and put in the seed containers without packing.

(e) The addition of water subsequent to placing the seed in test will depend

on the evaporation from the substrata in the germination chambers. Since the rate of evaporation will depend upon the relative humidity of the air, it is desirable to keep water in the germination chambers or to provide other means of supplying a relative humidity of approximately 95 percent. Germination tests should be observed at frequent intervals to insure an adequate moisture supply of the substrata at all times.

[20 FR 7931, Oct. 21, 1955]

§ 201.56 Interpretation.

(a) A seed shall be considered to have germinated when it has developed those essential structures which, for the kind of seed under consideration, are indicative of its ability to produce a normal plant under favorable conditions. Seedlings possessing those essential structures are referred to as normal seedlings. Abnormal seedlings, consisting of those which are broken, devoid of roots, malformed, or weak, and other types not possessing essential structures, shall not be considered to have germinated.

(b) Sand and/or soil tests may be used as a guide in determining the classification of questionable seedlings and the evaluation of germination tests made on approved artificial media. This is intended to provide a method of checking the reliability of tests made on artificial substrata when there may be doubt as to the proper evaluation of such tests.

(c) Seedlings infected with fungi or bacteria should be regarded as normal if all essential structures are present. A seedling that has been seriously damaged by bacteria or fungi from any source other than the specific seed should be regarded as normal if it is determined that all essential structures were present before the injury or damage occurred. Germination counts should be made on samples where contamination and decay are present at approximately 2-day intervals between the usual first count and the final count. During the progress of the germination test, seeds which are obviously dead and moldy and which may be a source of contamination of healthy seeds should be removed at each count and the number of such dead seeds should be recorded. When symptoms of certain diseases develop which can be readily recognized and identified, their presence should be noted.

(d) Seed units containing more than one seed or embryo, such as New Zealand spinach seed, Beta seed, double fruits of the carrot family (Umbelliferae), multiple seeds of burnet, and seed units of grasses consisting of multiple florets, shall be tested as a single seed and shall be regarded as having germinated if they produce one or more normal seedlings.

(e) Standard guides for seedling interpretation shall include the photographs of normal and abnormal seed-

lings¹ identified by photo numbers in table 2 in § 201.58 and the following descriptions for specific kinds and groups.

[20 FR 7931, Oct. 21, 1955, as amended at 25 FR 8771, Sept. 13, 1960]

§ 201.56-1 Goosefoot family (Chenopodiaceae) and Carpetweed family (Aizoaceae).

(a) Kinds of seed: Beet, swiss chard, mangel, spinach, and New Zealand spinach.

(b) A completely normal seedling of the kinds specified in paragraph (a) of this section should have a long, slender root with root hairs, a long, well-developed hypocotyl, two attached leaflike cotyledons and an intact but small epicotyl. Normal seedlings shall include those that have: (1) A well-developed, long, slender root with root hairs; (2) a stubby primary root provided the secondary roots are strong and the hypocotyl is near normal length, as in spinach; (3) at least one attached cotyledon, provided the seedling is otherwise normal; (4) slight infection by fungi, provided none of the essential seedling structures have been damaged; (5) normal seedling structures of Beta that have been discolored from toxic substances in the seed balls or other causes; or (6) at least one normal seedling from a seed ball, regardless of whether abnormal seedlings also emerge from the same fruit.

(c) Abnormal seedlings include those that have: (1) No root or a stubby primary root with poor secondary root development, usually associated with a shortened hypocotyl; (2) a malformed, shortened, twisted, watery, or stubby hypocotyl; usually associated with a stubby root but not necessarily so; (3) deep grainy lesions or cracks in the hypocotyl if they appear to interfere with the conducting tissues; (4) both cotyledons absent as in samples of "sheared" beets and occasional samples of spinach; (5) two large cotyledons, but a malformed, short hypocotyl, usually with a stubby root; (6) decayed cotyledons or hypocotyl, provided they are not the result of improper test conditions (if there is decay of beet seedlings in blotter tests the results from a properly conducted soil or sand test should be accepted as correct); or (7) various combinations of the abnormalities described in this paragraph.

[20 FR 7932, Oct. 21, 1955]

§ 201.56-2 Sunflower family (Compositae).

Kinds of seed: Artichoke, cardoon, chicory, dandelion, endive, great burdock, lettuce, safflower, salsify, and sunflower. By the end of the germina-

¹These photographs may be purchased from the Office of Information, United States Department of Agriculture, Washington, D.C. 20250.

tion test, a perfectly normal seedling belonging to the sunflower family should have a well-developed root with root hairs, a long and well-developed hypocotyl, two leaf-like cotyledons, and a small but visible epicotyl.

(a) Lettuce: The interpretations of lettuce seedlings are made only at the end of the test period. When used to describe seedling structures "normal length" means that length attained by a vigorous sample of the same variety of lettuce as the one being tested when both are placed under the same test conditions. Physiological necrosis of cotyledons is frequently manifested by softened, grayish, blackish, or reddish areas and should not be confused with natural pigmentation. Seedlings with extensive physiological necrosis and/or injured areas on the cotyledons are slower in growth and tend to be shorter than seedlings without such damage. It is not necessary to distinguish between necrotic areas and injury caused by fungi and bacteria since the interpretation is the same for all conditions. Seedlings interpretations are to be made with not more than a 7 \times magnification. Colored photographs of lettuce cotyledons are to be used as guides for classification. These photographs may be obtained from the U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Division, Seed Branch, Building 306, Room 213, Agricultural Research Center, Beltsville, Md. 20705.

(1) Normal seedlings include those that have: (i) Long, vigorous roots, over half the usual length for vigorous seedlings; (ii) long, vigorous hypocotyls, over half the usual length for vigorous seedlings, with no cracks or lesions extending into the central conducting tissue; (iii) two cotyledons either free of injury or with less than half the total cotyledon surface covered by physiological necrosis or injured areas (the hypocotyl and root should be more than half normal length); and (iv) an epicotyl entirely free of injury.

(2) Abnormal seedlings include those that have: (i) No roots, or roots clearly less than half normal length with root tips blunt, swollen, or discolored; (ii) hypocotyls clearly less than half normal length, or severely twisted or grainy, or with cracks or lesions extending into the central conducting tissue; (iii) only one cotyledon, or cotyledons with half or more than half their total area necrotic or injured (the hypocotyl and root are usually less than half normal length), or swollen cotyledons (usually grayish or darkened) with extremely short or vestigial hypocotyl and root (seed coat usually adhering to cotyledons); (iv) no epicotyl or an epicotyl with any degree of injury or physiological necrosis.

(b) Other kinds in the sunflower family: This group includes artichoke,

cardoon, sunflower, safflower, salsify, dandelion, chicory, endive, and great burdock.

(1) Normal seedlings include those that have: (i) A well-developed, long, slender primary root with root hairs; (ii) a stubby root if there are one or more strong secondary roots, provided the seedling is otherwise normal; (iii) a well-developed, long hypocotyl with no prominent breaks or deep lesions which might interfere with the conducting tissues; (iv) one complete cotyledon or two broken cotyledons with half or more original cotyledon tissue remaining attached to the seedling (epicotyl must be present); or (v) slight infection of the roots or hypocotyl with fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No root or a stubby root with weak secondary roots, usually associated with a shortened hypocotyl; (ii) a malformed hypocotyl, which may be curled, shortened, or thickened, usually associated with a stubby root; (iii) deep, unhealed cracks or grainy areas on the hypocotyl, extending into the conducting tissues; (iv) both cotyledons entirely broken off; (v) part of one cotyledon or two broken cotyledons with less than half of the original cotyledon tissue remaining attached; (vi) two normal cotyledons with a short malformed hypocotyl, usually with a stubby root; (vii) decayed cotyledons, provided the infection is not caused by improper test conditions; (viii) epicotyl absent; or (ix) various combinations of the abnormalities described.

[20 FR 7932, Oct. 21, 1955, as amended at 26 FR 10035, Oct. 26, 1961; 30 FR 7891, June 18, 1965; 32 FR 12780, Sept. 6, 1967; 38 FR 12731, May 15, 1973]

§ 201.56-3 Mustard family (Cruciferae).

Kinds of seed: Broccoli, brussels sprouts, cabbage, Chinese cabbage, cauliflower, collards, garden cress, upland cress, water cress, kale, Chinese kale, Siberian kale, kohlrabi, mustard, pakchoi, radish, rape, rutabaga, and turnip. By the end of the germination test, a perfectly normal cruciferous seedling should have a well-developed root, usually with root hairs, a long hypocotyl two intact green leaflike cotyledons and a small but visible epicotyl or growing point.

(a) *Radish and Brassica*. (1) Normal seedlings include those that have: (i) A well-developed, long, slender primary root with root hairs; (ii) a well-developed, long hypocotyl with no prominent breaks or deep lesions which might interfere with the conducting tissues; (iii) one or two cotyledons not decayed at the point of attachment to the hypocotyl, provided the epicotyl is also present; (iv) slight decay at the base of one cotyledon, provided the epicotyl is not infected; (v) less than 50 percent of the area of the cotyle-

dons covered with spots or darkened areas; or (vi) slight infection of roots or hypocotyl with fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No root or a stubby root, usually associated with a shortened hypocotyl; (ii) a malformed hypocotyl, which may be curled, shortened, or thickened and usually associated with a stubby root; (iii) deep, unhealed cracks or lesions (often grainy) on the hypocotyl, extending into the conducting tissues; (iv) decay at the point of attachment of both cotyledons to the hypocotyl which may or may not involve the terminal bud; (v) decay at the point of attachment of one cotyledon to the hypocotyl, provided the terminal bud is also decayed; (vi) 50 percent or more of the area of the cotyledons covered with spots or darkened areas; (vii) decayed roots or hypocotyl provided the infection was not caused by improper test conditions; (viii) watery hypocotyl (usually associated with some other abnormality of the seedlings) provided this condition is not caused by excessive moisture of the substratum; or (ix) various combinations of the abnormalities described in this paragraph.

(b) *Garden cress, upland cress, and water cress*. (1) Normal seedlings include those that have: (i) A well-developed, slender root with root hairs; (ii) a long, well-developed hypocotyl with no prominent breaks or deep lesions which might interfere with the conducting tissues; (iii) intact cotyledons; or (iv) slight infection with fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No root, or a stubby root, usually associated with a shortened hypocotyl; (ii) a malformed hypocotyl, which may be curled, twisted, shortened, or thickened and frequently associated with a stubby root; (iii) deep, unhealed cracks or grainy lesions on the hypocotyl, extending into the conducting tissues; (iv) watery hypocotyls, usually associated with stubby roots or decayed cotyledons; (v) cotyledons entirely broken off; (vi) decayed cotyledon, provided the infection was not caused by improper test conditions; or (vii) various combinations of the abnormalities described in this paragraph.

[20 FR 7932, Oct. 21, 1955, as amended at 25 FR 8772, Sept. 13, 1960; 28 FR 5361, May 30, 1963]

§ 201.56-4 Cucurbit family (Cucurbitaceae).

(a) Kinds of seed: Citron, cucumber, muskmelon or cantaloup, pumpkin, squash, and watermelon.

(b) By the end of the germination test a perfectly normal seedling should have a well-developed primary root with several secondary roots, a long

hypocotyl, two intact cotyledons, and an epicotyl or terminal growing bud.

(1) Normal seedlings include those that have: (i) A well-developed primary root with or without secondary roots; (ii) a stubby primary root with at least two strong and vigorous adventitious roots, provided the hypocotyl is not shortened very much; (iii) a long well-developed hypocotyl; (iv) two intact cotyledons; or (v) slight infection by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No primary root, a stubby primary root only, or a stubby primary root with weak secondary roots which are usually associated with a short hypocotyl; (ii) a malformed hypocotyl which may be shortened or thickened; (iii) a thickened and shortened hypocotyl and roots owing to injury from chemical treatment, provided the injury is still apparent in a soil or sand check test; (iv) decayed cotyledons or other essential seedling structures, provided the decay was not the result of improper test conditions; or (v) various combinations of the abnormalities described in this paragraph.

[20 FR 7933, Oct. 21, 1955]

§ 201.56-5 Grass family (Gramineae).

Kinds of seed: Bentgrasses, bluegrasses, bluestems, bromes, cereals, fescues, millets, orchard grass, redtop, ryegrass, sorghum, timothy, wheatgrass, and all other grasses listed in § 201.1(h).

In the grass family a perfect seedling should have a well-developed primary root system, an intact cotyledon or scutellum, seed free from serious decay and long, well-developed green leaves within the coleoptile. One or more leaves may have broken through the coleoptile by the end of the test period.

(a) *Barley, oats, rye, and wheat.* (1) Normal seedlings include those that have: (i) At least one primary or seminal root, but preferably two or three seminal roots, provided the shoot is well-developed and the grain is not badly decayed; (ii) well-developed green leaves, not badly split, regardless of whether the coleoptiles are split; (iii) spiral twisting or bending of the shoot, provided it is green in color, has normal length, and is not frost damaged; or (iv) slight infection by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No primary root, (ii) only one or two short or spindly seminal roots which are usually accompanied by weakened shoots and decayed grains; (iii) no green leaves, but only the white sheath or coleoptile formed, which may or may not be grainy, spirally twisted, split, or shortened; (iv) a shortened shoot, extending no more

than one-half the way up through the coleoptile; (v) a thin, spindly, or watery shoot usually accompanied by weak root development and decayed grains; (vi) badly shattered or longitudinally split leaves, with or without splitting of the coleoptile; (vii) thickened and shortened shoot (leaves and coleoptile) often the result of overtreatment of seed with chemicals; (viii) decayed shoots (usually weak and show decay near the point of attachment to the grain which has often decayed) provided the decay is not the result of improper test conditions; (ix) bad frost-damage characterized by grainy coleoptiles and spirally twisted leaves and coleoptiles; (x) coleoptiles developed without the leaves (in soil tests, some of the longest of the spirally twisted seedlings will appear fairly strong but most of them break off just above the attachment of the plumule and coleoptile to the grain; the shortest of the seedlings do not emerge in soil tests); or (xi) various combinations of the abnormalities described in this paragraph.

(b) *Rice.* (1) Normal seedlings include those that have: (i) One primary root, usually with numerous lateral roots (several permanent roots arising from the first node should be present if seedlings are not removed until the end of the test); (ii) well-developed green leaves, not badly split, regardless of whether the coleoptiles are split; or (iii) slight infection by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No roots; (ii) a spindly primary root with very little or no branching or secondary development; (iii) no green leaves, but only the white sheath or coleoptile; (iv) a spindly and sometimes watery shoot which is usually associated with decay of the rice grain; (v) a short leaf, extending no more than one-half the distance up through the coleoptile; (vi) shattered or longitudinally split plumules with or without splitting of the coleoptile; (vii) decayed plumules (usually appear weak and show decay near the point of attachment to the grain) provided the decay is not the result of improper test conditions; or (viii) various combinations of the abnormalities described in this paragraph.

(c) *Corn.* (1) Normal seedlings include those that have: (i) One primary root, usually with secondary roots present; (ii) no primary root, but with at least two vigorous secondary roots, provided the grain is not badly decayed, and the shoot is well-developed; (iii) well-developed green leaves, not badly split, regardless of whether the coleoptiles are split; (iv) twisted and curled shoots bound by the tough seedcoat, provided the shoot is not decayed; or (v) slight infection by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No primary or secondary roots; (ii) no primary roots but small and weak secondary roots; (iii) no plumule, but only the white sheath or coleoptile; (iv) a shortened plumule, extending no more than one-half the way up through the coleoptile; (v) a thickened and shortened shoot, often the result of overtreatment of seed with chemicals; (vi) a spindly and pale shoot, usually associated with moldy seeds; (vii) albino (entirely white) seedlings, which will not develop into plants because of lack of chlorophyll; (viii) shattered or longitudinally split leaves, with or without splitting of the coleoptile; (ix) decayed shoots of which the plumules usually appear weak and show decay near the point of attachment to the grain and the scutellum is usually rotten, provided the decay is not the result of improper test conditions; or (x) various combinations of the abnormalities described in this paragraph.

(d) *Sorghum* spp. (1) Normal seedlings include those that have: (i) One vigorous primary root, usually with well-developed lateral branches by the end of the test period; (ii) short primary root, but with at least two vigorous lateral roots; (iii) well-developed green leaves not badly split, regardless of whether coleoptiles are split; (iv) slight infection by fungi, provided none of the essential seedling structures have been damaged; (v) red coloration on the roots and on the coleoptile of the shoot, caused by natural pigments, provided the seedling is otherwise normal.

(2) Abnormal seedlings include those that have: (i) No roots; (ii) weak, spindly, or short primary root, and less than two vigorous lateral roots (often associated with decay of the grain); (iii) no plumule, but only the sheath or coleoptile; (iv) a shortened plumule, extending no more than one-half the way up through the coleoptile; (v) a spindly, pale plumule, usually associated with moldy seeds; (vi) shattered and longitudinally split plumules, with or without splitting of the coleoptile; (vii) decayed plumules, provided the decay is not due to improper testing conditions (the plumules usually appear weak and show decay near the point of attachment of the grain, which is usually decayed); or (viii) various combinations of the abnormalities described.

(e) *Grasses and millets.* (1) Normal seedlings include those that have: (i) A well-developed primary root, usually with root hairs; (ii) well-developed green leaves, not badly split, regardless of whether the coleoptiles are split; (iii) slight infection by fungi, provided none of the essential seedling structures have been damaged; (iv) spirally coiled roots held within the tightly enveloping glumes as in certain samples of Bermuda grass; or (v) poor

root development resulting from injury caused by use of a potassium nitrate solution (if many roots are so affected, a retest should be made on top of soil in closed Petri dishes).

(2) Abnormal seedlings include those that have: (i) No root; (ii) a weak, stubby, or spindly root, usually short and watery, associated with a decayed seed; (iii) no plumule, but only the white sheath or coleoptile which is often short and thick; (iv) a shortened plumule, extending only one-half the distance up through the coleoptile; (v) a spindly plumule, usually pale and watery; (vi) a shattered longitudinally split plumule with or without splitting of the coleoptile; (vii) decayed plumules, provided the decay is not the result of improper test conditions (the plumules usually appear weak and show decay near the point of attachment to the seed, which is usually rotten); or (viii) various combinations of the abnormalities described in this paragraph.

[20 FR 7933, Oct. 21, 1955, as amended at 24 FR 3954, May 15, 1959; 30 FR 7891, June 18, 1965]

S 201.56-6 Legume or pea family (Leguminosae).

Kinds of seed: Alfalfa, alyceclover, asparagusbean, beans (*Phaseolus* spp.), beggarweed, black medic, broad-bean, bur-clovers, button-clover, chickpea, clovers (*Trifolium* spp.), cowpea, crotalaria, crownvetch, guar, hairy indigo, kudzu, lentil, lespedezas, lupines, peas, peanut, rough pea, sainfoin, sesbania, sourclover, soybean, sweetclover, trefoils, velvetbean, and vetches.

(a) *Beans: adzuki, field, garden, lima, and mung.* Seedling interpretation for all these beans is similar as they all have the same type of development.

(1) Normal seedlings include those that have: (i) A terminal bud or epicotyl, and at least one primary leaf, with one complete cotyledon or two broken cotyledons with half or more of the original cotyledon tissue remaining attached to the seedling; except that adzuki, field, lima and mung may have both cotyledons missing provided the seedling is otherwise normal; (ii) a primary root or adventitious or secondary roots sufficient to anchor the seedling when grown in soil or sand, provided the hypocotyl is approximately of normal length; (iii) a fairly well-developed hypocotyl with no prominent breaks or deep lesions (healed breaks, sometimes referred to as knees, are to be considered as normal, provided the seedling is not spindly); (iv) spirally twisted and curled roots and hypocotyl held within the tough seedcoat, causing delayed development, but are otherwise normal; (v) slight infection caused by fungi or bacteria, provided the essential structures have not been seriously damaged and appear to be able to carry on their normal func-

tions at the time of evaluation. (If a few seedlings with total or partial decay of the plumule are found, they may be counted as normal, provided the hypocotyl and root are well-developed. The plumules on such seedlings usually do not decay when grown under greenhouse conditions where the cotyledons open up naturally and are exposed to a dry environment and sunlight. However, if there are many seedlings with decayed plumules in a test, a retest should be made and such seedlings evaluated cautiously.)

(2) Abnormal seedlings include those that have: (i) No primary leaves or terminal bud (baldheads); (ii) no primary leaves, but with a terminal bud (snakeheads or partial baldheads); (iii) no primary leaves, but terminal bud present and axillary buds in one or both of the cotyledons (partial baldheads); (iv) part of one cotyledon or two broken cotyledons with less than half the original tissue remaining attached; except that adzuki, field, lima and mung must have seedlings that are weak and lacking in vigor when both cotyledons are missing; (v) a malformed hypocotyl, which may be characterized by open splits, or one that appears curled, shortened, or thickened; (vi) no primary root or well-developed set of adventitious or secondary roots; or various combinations of the abnormalities described in this paragraph.

(b) *Broadbean, runner bean, velvetbean, chickpea, field pea, garden pea, roughpea, lentil, and vetches.* In this group a perfectly normal seedling should have a well-formed root, with or without secondary or adventitious development, a strong epicotyl with fairly long stem, a well-developed epicotyl with the leaves and terminal bud intact, and attached cotyledons.

(1) Normal seedlings include those that have: (i) A primary root or a set of secondary or adventitious roots sufficient to anchor the seedling when grown in soil or sand, provided the stem is not badly shortened; (ii) a fairly well-developed stem with no prominent breaks or deep lesions which might interfere with the conducting tissues; (iii) a terminal bud with at least one first leaf and an intact growing point; (iv) two shoots, provided the seedling appears vigorous and at least one of the shoots has a normal epicotyl and root; (v) slight infection by fungi, provided the essential seedling parts have not been seriously damaged and appear to be able to carry on their normal functions at the time of evaluation; or (vi) at least one complete cotyledon or two broken cotyledons with half or more of the cotyledon tissue remaining attached to the seedling.

(2) Abnormal seedlings include those that have: (i) No primary root or well-developed secondary or adventitious roots; (ii) a malformed stem, which may be characterized by severe open

splits, and curled, shortened, or thickened development; (iii) no epicotyl, or an epicotyl without the terminal bud; (iv) two shoots both of which appear weak and spindly, often partially broken away from the cotyledons; (v) decay caused by the spread of organisms from the cotyledons of the developing seedling; (vi) part of one cotyledon or two broken cotyledons with less than half of the cotyledon tissue remaining attached; or (vii) various combinations of the abnormalities described.

(c) *Cowpeas, lupines, peanuts, soybeans and asparagusbeans.* A completely normal seedling of the above-mentioned kinds should have a well-formed root with or without secondary or adventitious roots, a strong and fairly long hypocotyl with two attached and open cotyledons, two well-developed primary leaves, and an intact terminal bud or epicotyl.

(1) Normal seedlings include those that have: (i) A primary root or a set of secondary or adventitious roots sufficient to anchor the seedling when grown in soil or sand, provided the hypocotyl is normal; (ii) a fairly well-developed hypocotyl with no prominent breaks or deep lesions which might interfere with the conducting tissues; (iii) a plumule with at least one leaf and an intact growing point; (iv) slight infection by fungi, provided the essential seedling parts have not been seriously damaged and appear to be able to carry on their normal functions at the time of evaluation; or (v) at least one complete cotyledon or two broken cotyledons with one-half or more of the cotyledon tissue remaining attached to the seedling. Cowpea and asparagusbean may have both cotyledons missing.

(2) Abnormal seedlings include those that have: (i) No primary root or no well-developed secondary or adventitious roots; (ii) a malformed hypocotyl which may be curled, shortened, or thickened or have severe open splits; (iii) no epicotyl, or one without the growing point, with or without leaves; (iv) decayed epicotyl, provided the decay has spread from the rotted cotyledons of the developing seedling; or (v) various combinations of the abnormalities described in this paragraph.

(d) *Alfalfa, alyceclover, beggarweed, black medic, burclovers, buttonclover, clovers, crotalaria, crownvetch, guar, hairy indigo, kudzu, lespedezas, sainfoin, sesbania, sourclover, sweetclovers, trefoils.* By the end of the germination test a perfectly normal seedling should have a long, slender root, usually with root hairs, a long hypocotyl, two attached cotyledons which have opened, and an intact epicotyl or growing point.

(1) Normal seedlings include those that have: (i) A long, slender root, usually with root hairs; (ii) slightly stubby roots on blotter tests of sweetclovers,

provided the seedling is otherwise normal; (iii) roots slightly stubby from being held back by the attached seed-coat, provided the seedling is otherwise normal; (iv) short splits on the roots, provided the split does not extend into the central conducting tissues of the hypocotyl, and provided further that root hairs are present and the seedling is normal in other respects; (v) a long, well-developed hypocotyl which may have slight cracks or breaks, provided they do not extend into the conducting tissues; (vi) at least one cotyledon, provided the epicotyl is also present; or (vii) slight infection by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) Stubby roots, usually associated with shortened hypocotyl; (ii) longitudinal, deep splits on the roots, extending into the conducting tissues of the hypocotyls; (iii) deep cracks or breaks in the hypocotyl which extend into the conducting tissues; (iv) both cotyledons broken off; (v) one cotyledon broken off if the epicotyl is also absent; (vi) rotted cotyledons, provided the decay did not spread to the seedling from an adjacent seed or was not the result of improper test conditions; (vii) A spindly, watery hypocotyl, provided it is not the result of excess moisture in the substrata (usually seedlings of this type have one or more abnormalities of the essential structures, such as broken cotyledons or deep splits in the hypocotyl); or (viii) various combinations of the abnormalities described in this paragraph.

[20 FR 7934, Oct. 21, 1955, as amended at 22 FR 4911, July 12, 1957; 25 FR 8772, Sept. 13, 1960; 30 FR 7891, June 18, 1965; 32 FR 12781, Sept. 6, 1967; 46 FR 53638, Oct. 29, 1981]

§ 201.56-7 Lily family (Liliaceae).

Kinds of seed: Asparagus, chives, leek, onion, and Welsh onion.

(a) *Chives, onion, Welsh onion, and leek.* By the end of the test period a perfectly normal onion or leek seedling should have a long, slender root with a thickened area where it is joined to the hypocotyl, and a long, green cotyledon with a definite loop or bend, often referred to as the "knee".

(1) Normal seedlings include those that have: (i) A well-developed, long, slender root, with or without root hairs; (ii) a long, green, leaf-like cotyledon, with a well-developed bend or "knee" or (iii) slight infection by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) A thickened hypocotyl with no root, or a stubby root, (ii) a very short cotyledon associated with a poorly developed root, (iii) a poorly developed leaf-like cotyledon without a definite bend or "knee", (iv) a spindly,

watery cotyledon, often associated with slowness in sprouting, and one or more other abnormalities, (v) a rotted cotyledon, provided the decay is not the result of improper test conditions, or (vi) various combinations of the abnormalities described in this paragraph.

(b) *Asparagus.* By the end of the test period a normal asparagus seedling should have a long, slender root, a fairly long epicotyl, an intact terminal bud, and the seedling should not be broken away from the cotyledon.

(1) Normal seedlings include those that have: (i) A long, slender root; (ii) a long, well-developed epicotyl with terminal growing point; (iii) the cotyledon attached to the seedling; or (iv) slight infestation by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) No root, or a very stubby root with weak secondary root development; (ii) a malformed epicotyl, which may be thickened, shortened, or twisted; (iii) no terminal growing point or bud; (iv) cotyledon broken away from the seedling; (v) decayed epicotyl, provided the decay is not the result of improper test conditions; or (vi) various combinations of the abnormalities described in this paragraph.

[20 FR 7935, Oct. 21, 1955, as amended at 25 FR 8772, Sept. 13, 1960; 26 FR 10035, Oct. 26, 1961]

§ 201.56-8 Flax family (Linaceae).

(a) Kind of seed: Flax.

(b) By the end of the germination test a normal flax seedling should have a well-developed primary root, a long hypocotyl, two intact cotyledons, and a small epicotyl.

(1) Normal seedlings include those that have: (i) A long, slender root, usually with root hairs; (ii) a short or stubby primary root, provided secondary root development is strong and the hypocotyl is of normal length or approximately so; (iii) a long, well-developed hypocotyl with no breaks or lesions extending into the conducting tissues; (iv) at least one attached cotyledon, provided the epicotyl is not injured; (v) variously broken or cracked cotyledons, provided the other seedling parts appear normal; or (vi) slight infection by fungi, provided none of the essential seedling structures have been damaged.

(2) Abnormal seedlings include those that have: (i) A stubby or no primary root, provided the secondary root development is weak, a condition usually associated with a shortened hypocotyl; (ii) a malformed hypocotyl, which may be twisted, thickened, or shortened; (iii) deep cracks or lesions on the hypocotyl, extending into the conducting tissues; (iv) both cotyledons broken off; (v) one cotyledon broken off if the epicotyl is also injured (vi) decayed cotyledons or other essential seedling structures, provided the decay is not

the result of improper test conditions; or (vii) various combinations of the abnormalities described in this paragraph.

[20 FR 7935, Oct. 21, 1955]

§ 201.56-9 Mallow family (Malvaceae).

(a) Kinds of seed: Cotton an okra.

(b) By the end of the germination test a perfectly normal seedling should have a long, well-developed root with root hairs, a long hypocotyl, two attached green leaflike cotyledons, and a small epicotyl.

(1) Normal seedlings include those that have: (i) A well-developed, long, slender root, usually with root hairs; (ii) no primary root but strong secondary roots, provided the hypocotyl is of normal or approximately normal length; (iii) a long, well-developed hypocotyl with no breaks or deep grainy lesions which might interfere with the conducting tissues; (iv) at least one cotyledon and intact epicotyl; (v) slight infection by fungi, provided none of the essential seedling structures have been damaged; or (vi) yellowish hypocotyls or roots of cotton which may appear diseased, provided the cotyledons are free of infection (the seedcoat must be peeled back on young seedlings to determine this condition of the cotyledons).

(2) Abnormal seedlings include those that have: (i) No root or very stubby roots, usually associated with a shortened hypocotyl; (ii) stubby roots and a thickened hypocotyl resulting from chemical treatment of seed, such as often occurs on delinted cottonseed; (iii) malformed hypocotyl, which may be curled, thickened, or shortened; (iv) deep cracks or grainy lesions on the hypocotyl which appear to interfere with the conducting tissues; (v) epicotyl absent, even though one or both cotyledons are attached; (vi) decayed cotyledons and hypocotyl, provided the decay did not spread from another seed or was not the result of improper test conditions; or (vii) various combinations of the abnormalities described in this paragraph.

[20 FR 7935, Oct. 21, 1955]

§ 201.56-10 Spurge family (Euphorbiaceae).

Kind of seed: Castorbean.

(a) Normal seedlings include those that have:

(1) A primary root or a set of secondary or adventitious roots sufficient to anchor the seedling when grown in soil or sand, provided the hypocotyl is not badly shortened;

(2) A fairly well-developed hypocotyl with no prominent breaks or stem lesions which might interfere with the conducting tissues;

(3) An epicotyl with terminal bud;

(4) Both cotyledons (thin leaf-like structures) present and intact, plus an intact epicotyl;

(5) At least one attached endosperm-bearing organ (fleshy food storage organs resembling cotyledons);

(6) Slight infection by fungi or bacteria, provided the essential seedling parts have not been seriously damaged and appear to be able to carry on their normal functions at the time of evaluation.

(b) Abnormal seedlings include those that have:

(1) No primary root or well-developed adventitious or secondary roots;

(2) A malformed stem, which may be characterized by severe open splits, and curled, shortened or thickened hypocotyl;

(3) No epicotyl, or an epicotyl without the terminal bud;

(4) No attached endosperm-bearing organ;

(5) Less than two cotyledons present;

(6) Decay caused by micro-organisms carried by the individual seed or seedling being evaluated; or

(7) Various combinations of the abnormalities described in this paragraph.

[20 FR 7935, Oct. 21, 1955, as amended at 25 FR 8772, Sept. 13, 1960]

tending into the conducting tissues; (4) both cotyledons, or one cotyledon and epicotyl, broken off; (5) two enlarged cotyledons, but hypocotyl short and usually malformed; (6) watery hypocotyl or root; (7) grainy hypocotyl or root; (8) decayed cotyledons or hypocotyl, provided they are not the result of improper test conditions; or (9) various combinations of the abnormalities described in this paragraph.

[20 FR 7935, Oct. 21, 1955, as amended at 25 FR 8772, Sept. 13, 1960]

§ 201.57 Hard seeds.

Seeds which remain hard at the end of the prescribed test because they have not absorbed water, due to an impermeable seed coat, are to be counted as "hard seed." If at the end of the germination period provided for legumes, okra, cotton and dichondra in these rules and regulations there are still present swollen seeds or seeds of these kinds which have just started to germinate, all seeds or seedlings except the above-stated shall be removed and the test continued for 5 additional days and the normal seedlings included in the percentage of germination.

[5 FR 33, Jan. 4, 1940, as amended at 10 FR 9952, Aug. 11, 1945; 20 FR 7936, Oct. 21, 1955]

§ 201.57a Dormant seeds.

Dormant seeds are viable seeds, other than hard seeds, which fail to germinate when provided the specified germination conditions for the kind of seed in question.

(a) Viability of ungerminated seeds shall be determined by any of the following methods or combinations of methods: a cutting test, tetrazolium test, scarification, or application of germination promoting chemicals.

(b) The percentage of dormant seed, if present, shall be determined in addition to the percentage of germination for the following kinds: Bahiagrass (*Paspalum notatum*), bluestems (*Andropogon gerardii*, *A. hallii*, *Bothriochloa ischaemum* and *Schizachyrium scoparium*), buffalograss (*Buchloe dactyloides*), buffelgrass (*Cenchrus ciliaris*), gramas (*Bouteloua* spp.), Indian ricegrass (*Oryzopsis hymenoides*), lovegrasses (*Eragrostis* spp.), sand dropseed (*Sporobolus cryptandrus*), smilo (*Oryzopsis miliacea*), switchgrass (*Panicum virgatum*), veldtgrass (*Ehrharta calycina*), western wheatgrass (*Agropyron smithii*), and yellow indiangrass (*Sorghastrum nutans*).

[46 FR 53638, Oct. 29, 1981]

§ 201.58 Substrata, temperature, duration of test, and certain other specific directions for testing for germination and hard seed.

Specific germination requirements are set forth in table 2 in paragraph

(c) to which the following paragraphs (a) and (b) are applicable:

(a) *Definitions and explanations applicable to table 2—(1) Duration of tests.* The following deviations are permitted from the specified duration of tests: Any test may be terminated prior to the number of days listed under "Final count" if the maximum germination of the sample has then been determined. The number of days stated for the first count is approximate and a deviation of 1 to 3 days is permitted. If at the time of the prescribed test period the seedlings are not sufficiently developed for positive evaluation, it is possible to extend the time of the test period two additional days. (Also, see paragraph (a)(5) of this section and § 201.57.)

(2) *Light.* Cool white fluorescent light shall be provided where light is required in table 2. The light intensity shall be 75 to 125 foot-candles (750-1,250 lux). (The light intensity for nondormant seed and during seedling development may be as low as 25 foot-candles to enable the essential structures to be evaluated with greater certainty.) The seeds shall be illuminated for at least 8 hours every 24 hours except when transferred to a low temperature germinator during the weekend. When seeds are germinated at alternating temperatures they shall be illuminated during high temperature periods. Seeds for which light is prescribed shall be germinated on top of the substratum except for ryegrass fluorescence tests.

(3) *Moisture-on-dry-side.* This term means that the moistened substratum should be pressed against a dry absorbent surface such as a dry paper towel or blotter to remove excess moisture. The moisture content thus obtained should be maintained throughout the germination test period.

(4) *Potassium nitrate (KNO₃).* These terms mean a two-tenths (0.2) percent solution of potassium nitrate (KNO₃) shall be used in moistening the substratum. Such solution is prepared by dissolving 2 grams of KNO₃ in 1,000 ml. of distilled water. The grade of the potassium nitrate shall meet A.C.S. specifications.

(5) *Prechill.* The term "prechill" means to place the seed on, or in, a moist substratum at a specified low temperature for a designated period of time. The prechilling period is not included in the duration of tests given in table 2, unless otherwise specified.

(6) *Predry.* The term "predry" means to place the seed in a shallow layer at a temperature of 35° to 40° C. for a period of 5 to 7 days, with provisions for circulation of the air.

(7) *Substrata (Kinds).* The symbols used for substrata are:

B = between blotters

TB = top of blotters

T= paper toweling, used either as folded towel tests or as roll towel tests in horizontal or vertical position

S= sand or soil

TS= top of sand or soil

P= covered Petri dishes; with two layers of blotters; with one layer of absorbent cotton; with five layers of paper toweling; with three thicknesses of filter paper; or with sand or soil

C= creped cellulose paper wadding (0.3-inch thick Kimpak or equivalent) covered with a single thickness of blotter through which holes are punched for the seed that are pressed for about one-half their thickness into the paper wadding

TC= on top of creped cellulose paper without a blotter

RB= blotters with raised covers, prepared by folding up the edges of the blotter to form a good support for the upper fold which serves as a cover, preventing the top from making direct contact with the seeds.

(8) *Temperature.* A single numeral indicates a constant temperature. Two numerals separated by a dash indicate an alternation of temperature, the test to be held at the first temperature for approximately 16 hours and at the second temperature for approximately 8 hours per day. The temperature shall be determined at the substratum level and shall be as uniform as possible throughout the germination chamber. (A sharp alternation of temperature, such as obtained by hand transfer, may be beneficial in breaking dormancy.) If tests are not subjected to alternating temperatures over weekends and on holidays, they are to be held at the first-mentioned temperature during this time. In cases where two temperatures are indicated (separated by a semicolon) the first temperature shall be regarded as the regular method and the second as an alternate method.

(9) Paper substrata must be free of chemicals toxic to germinating seed and seedling growth. If root injury occurs from toxicity of a paper substratum or from the use of potassium nitrate, retests shall be made on soil or on a substratum moistened with water.

(10) *Ethepron.* This term means a 29 parts per million (0.0029 percent) solution of ethepron [(2-chloroethyl) phosphonic acid] which shall be used to moisten the substratum. This solution is prepared by mixing 0.6 ml of a stock solution with 5,000 ml of distilled water. The stock solution contains 24 grams of active material per 100 ml of propylene glycol or two pounds of active material per gallon. A solution which is five times this concentration (5 x 29 ppm) may be used for extremely dormant seeds, provided

seeds are transferred to substratum moistened with water after 1 to 3 days.

(11) *Ethylene.* This term means that five (5) ml of ethylene gas per cubic foot (176.57 ml/m³) of germinator space is injected into a germinator in which peanut seeds in moist rolled towels have been placed. Following injection of the ethylene, the germinator is kept closed until the first count (5 days). If the germinator door is opened for the purpose of checking or rewetting the samples, another injection of ethylene at the same rate shall be made.

(b) *Special procedures and alternate methods for germination referred to in table 2—(1) Alyceclover (*Alysicarpus vaginalis*); Swollen seeds.* At the conclusion of the 21-day test period carefully pierce the seedcoat with a sharp instrument and continue the test for 5 additional days.

Alternate method: The swollen seeds may be placed at 20° C. for 48 hours and then at 35° C. for 3 additional days.

(2) *Bahiagrass (*Paspalum notatum*); removal of glumes.* On all varieties except "Pensacola", remove the enclosing structures (glumes, lemma, and palea) from the caryopsis with the aid of a sharp scalpel. If the seed is fresh or dormant, scratch the surface of the caryopsis lightly.

(3) *Beet, Swiss chard (*Beta*); preparation of seed for test.* Before placing the seeds on the germination substratum they shall be soaked in water for 2 hours, using at least 250 ml. of water per 100 seeds, then washed in running water and the excess water should be blotted off. The temperature of the soaking and washing water should be no lower than 20° C. Samples producing darkened radicles should be retested in soil or by washing in running water for 3 hours and tested on "Kimpak," keeping the seed covered with slightly moist blotters. Sugar beets may require 16 hours soaking in water at 25° C., followed by rinsing and then drying for 2 hours at room temperature.

(4) *Buffelgrass (*Pennisetum ciliare*); alternate method for dormant seed.* The caryopses shall be removed from the fascicles and placed on blotters moistened with a 0.2 percent potassium nitrate solution, in Petri dishes. The seeds from a fascicle should be arranged so they will not be confused with seeds from other fascicles during the test. The seeds are then prechilled at 5° C. for 7 days and tested at 30° C. in light for 21 additional days. Firm ungerminated seeds remaining at the conclusion of the test should be

scratched lightly and left in test for 7 additional days.

(5) *Cotton (*Gossypium spp.*); dormant samples.* Samples of cottonseed which do not respond to the usual method should be placed in a closed container with water and shaken until the lint is thoroughly wet. The excess moisture should then be blotted off.

(6) *Endive (*Cichorium endivia*); dormant samples.* Add about $\frac{1}{8}$ inch of tap water at the beginning of the test and remove excess water after 24 hours.

(7) [Reserved]

(8) *Rescue grass (*Bromus unioloides*); dormant samples.* Wash for 48 hours in running water, or soak for 48 hours, changing the water and rinsing each morning and night.

(9) *Rice (*Oryza sativa*)—Alternate method.* Plant the seeds in moist sand. On the seventh day of the test add water to a depth of one-fourth inch above the sand level and leave for the remainder of the test. Only a final count is made. Dormant seeds: Presoak 24 to 48 hours in 40° C. water. For deeply dormant seeds, presoak 24 hours in 1,000 p.p.m. ethylene chlorhydrin or 5 percent solution of sodium hypochlorite (clorox at bottle strength).

(10) *Ryegrass (*Lolium*); fluorescence-test.* The germination test for the fluorescence of ryegrass shall be conducted in light (not to exceed 100 foot-candles) with white filter paper as a substratum. The test shall be conducted in a manner that will prevent the contact of roots of different seedlings. If there are over 75 percent normal fluorescent seedlings present at the time of the first count, break the contact of the roots of the nonfluorescent seedlings from the substratum and reread the fluorescence at the time of the final count.

(11) *Trifolium, Medicago, Melilotus, and Vicia faba; temperature requirements.* A temperature of 18° C. is desirable for *Trifolium spp.*, *Medicago spp.*, *Melilotus spp.*, and *Vicia faba*.

(12) *Garden beans (*Phaseolus vulgaris*); use of calcium nitrate.* If hypocotyl collar rot is observed on seedlings, the sample involved may be retested using a 0.3 to 0.6 percent solution of calcium nitrate to moisten the germination medium.

(13) *Fourwing Saltbush (*Atriplex canescens*); preparation of seed for test.* De-wing seeds and soak for 2 hours in 3 liters of water after which rinse with approximately 3 liters of distilled water. Remove excess water, air dry for 7 days at room temperature, then test for germination as indicated in Table 2.

Table 2—Germination Requirements for Indicated Kinds

Name of seed	Substrato	Temperature (°C)	First count (Days)	Final count (Days)	Additional directions	
					Specific requirements and photo numbers	Fresh and dormant seed
AGRICULTURAL SEED						
Agrotricum— <i>Agratiticum</i>	B, T, S.....	20; 15	4	7		Prechill at 5° or 10° C. for 5 days.
Alfalfa— <i>Medicago sativa</i>	B, T, S.....	20	4	17	Photos 2481, 2486; see par. (b)(11).....	
Alfileria— <i>Eruium cicutarium</i>	B, T.....	20-30	3	14	Clip seeds.....	
Alyceclover— <i>Alysicarpus vaginalis</i>	B, T.....	35	4	121	See par. (b)(1) for swollen seeds.....	
Bohiogross— <i>Paspalum notatum</i> :						
Var. <i>Pensacola</i>	P, S.....	20-35	7	28	Light; see par. (b)(2).....	
All other vars.....	P.....	30-35	3	21	Light; remove glumes; see par. (b)(2).....	See Dormant seeds—§ 201.570 Scratch coryopses; KNO ₃ ; See Dormant seeds—§ 201.570
Borrelclover— <i>Medicago tribuloides</i>	B, T.....	20	4	114	Remove seeds from bur; see par. (b)(11).....	
Borley— <i>Hordeum vulgare</i>	B, T, S.....	20; 15	4	7		Prechill 5 days at 5° or 10° C. or predry.
Beon:						
Adzuki— <i>Vigna angularis</i>	B, T, S.....	20-30	4	10		
Field— <i>Phaseolus vulgaris</i>	B, T, S.....	20-30; 25	5	18		
Mung— <i>Vigna radiata</i>	B, T, S.....	20-30	3	17		
Beet, field— <i>Beta vulgaris</i>	B, T, S.....	20-30	3	14	Photos 19557, 19558; see par. (b)(3).....	
Beet, sugar— <i>Beta vulgaris</i>	B, T, S.....	20-30; 20	3	10	....do.....	
Beggoweed, Florida— <i>Desmodium tenuifolium</i>	B, T.....	30	5	28		
Bentgrass:						
Colonial (including Astoria and Highland)—	P.....	15-30; 10-30;	7	28	Light; KNO ₃	Prechill at 5° or 10° C. for 7 days; see par. (a)(2).....
<i>Agrastis tenuis</i>		15-25				
Creeping— <i>Agrrostis stolonifera</i> var. <i>palustris</i>	P.....	15-30; 10-30;	7	28	....do.....	Prechill at 5° or 10° C. for 7 days.
Velvet— <i>Agrastis canina</i>	P.....	15-25 20-30	7	21	....do.....	
Bermudagrass— <i>Cynodon dactylon</i>	P.....	20-35	7	21	Light; KNO ₃ ; photo 2518; see par. (a)(9).....	Prechill at 10° C. for 7 days and then test at 20°-35°. Continue tests of hulled seed for 14 days and of unhulled seed for 21 days.
Bermudagrass— <i>Cynodon dactylon</i> var. <i>aridus</i>	P.....	20-35	7	21	....do.....	
Bluegrass:						
Bulbous— <i>Poa bulbosa</i>	P, S.....	10	10	35	KNO ₃ or soil.....	Prechill all samples at 5° C. for 7 days.
Conodo— <i>Poa compressa</i>	P.....	15-25; 15-30	10	28	Light; KNO ₃ ; see par. (a)(2).....	10-30° C.
Glucontho— <i>Poa glauantha</i>	P.....	15-25; 15-30	10	28	Light; KNO ₃	
Kentucky (all var.)— <i>Poa pratensis</i>	P.....	15-25 15-30	10	28	....do.....	Prechill at 10° C. for 5 days.
Nevado— <i>Poa nevadensis</i>	P.....	20-30	7	21	....do.....	
Rough— <i>Poa trivialis</i>	P.....	20-30	7	21	Light.....	
Texas— <i>Poa arachnifera</i>	P.....	20-30	7	28	Light; KNO ₃	Prechill at 5° C. for 2 weeks.
Wood— <i>Poa nemoralis</i>	P.....	20-30	7	28	Light.....	
Bluestem:						
Big— <i>Andropogon gerardii</i>	P, TS.....	20-30	28	Light; KNO ₃	Prechill at 5° C. for 2 weeks.....	
Little— <i>Schizachyrium scoparium</i>	P, TS.....	20-30	7	28	....do.....	See Dormant seeds—§ 201.570
Sond— <i>Andropogon hallii</i>	P, TS.....	20-30	7	28	....do.....	See Dormant seeds—§ 201.570
Yellow— <i>Bathyachloa ischaemum</i>	P, TS.....	20-30	5	21	....do.....	See Dormant seeds—§ 201.570
Brome:						
Field— <i>Bramus arvensis</i>	P, TB.....	15-25; 20-30	6	14	Light.....	Prechill at 10° C. for 5 days.
Meadow— <i>Bramus biebersteinii</i>	B, T, TB.....	20-30	6	14	Light optional.....	
Mountain— <i>Bramus marginatus</i>	P.....	20-30	6	14	....do.....	
Smooth— <i>Bramus inermis</i>	P, B, TB.....	20-30	6	14	Light optional.....	Prechill at 5° or 10° C. for 5 days, then test at 30° C. for 9 additional days.
Broomcorn— <i>Sorghum bicolor</i>	B, T, S.....	20-30	3	10		
Buckwheat— <i>Fagopyrum esculentum</i>	B, T.....	20-30	3	6		
Buffalograss— <i>Buchloe dactylonoides</i> :						
(Burs).....	P, TB, TS.....	20-35	7	28	Light; KNO ₃	Prechill at 5° C. for 6 weeks; test 14 additional days. See Dormant seeds—§ 201.570.
(Coryopses).....	P.....	20-35	5	14	Light; KNO ₃	See Dormant seeds—§ 201.570.
Buffelgrass— <i>Cenchrus ciliaris</i>	S.....	30	7	28	Light; press fascicles into well-packed soil and prechill at 5° C. for 7 days.	See par. (b)(4). See Dormant seeds—§ 201.57a.
Burclover, California— <i>Medicago polymorpha</i>	B, T.....	20	4	114	Remove seeds from bur; see par. (b)(11).....	
Burclover, spotted— <i>Medicago arabica</i>	B, T.....	20	4	114	....do.....	
Burnet, little— <i>Sanguisorba minor</i>	B, T.....	15	5	14		
Buttonclover— <i>Medicago arbicularis</i>	B, T.....	20	4	110	See par. (b)(11).....	15° C.
Canarygrass— <i>Phalaris canariensis</i>	B, T.....	20-30	3	7		
Conarygrass, reed— <i>Phalaris arundinacea</i>	P.....	20-30	5	21	Light; KNO ₃	
Corpetgrass— <i>Acanthus affinis</i>	P.....	20-35	10	21	Light.....	KNO ₃
Costorbeon— <i>Ricinus communis</i>	T, S.....	20-30	7	14	Remove coruncle if mold interferes with test.....	
Chess, soft— <i>Bramus mollis</i>	P.....	20-30	7	14	Light.....	Prechill at 5° or 10° C. for 7 days.
Chickpeo— <i>Cicer arietinum</i>	T, S.....	20-30	3	7		
Clovers:						
Alsike— <i>Trifolium hybridum</i>	B, T, S.....	20	3	17	See par. (b)(11).....	15° C.
Arrowleaf— <i>Trifolium vesiculosum</i>	B, T.....	20	4	114	See par. (b)(11).....	
Berseem— <i>Trifolium alexandrinum</i>	B, T, S.....	20	3	17	....do.....	....Do.
Cluster— <i>Trifolium glomeratum</i>	B, T.....	20	4	110	....do.....	....Do.
Crimson— <i>Trifolium incarnatum</i>	B, T, S.....	20	4	17	See par. (b)(11); photos 2479, 2482.....	....Do.
Kenyo— <i>Trifolium semipilosum</i>	B, T, S.....	20	3	17		
Lodino— <i>Trifolium repens</i>	B, T, S.....	20	3	17	See par. (b)(11).....	15° C.
Loppo— <i>Trifolium lappaceum</i>	B, T.....	20	3	17	....do.....	....Do.
Large hop— <i>Trifolium campestre</i>	B, T.....	20	4	114	....do.....	....Do.
Persian— <i>Trifolium resupinatum</i>	B, T.....	20	3	17	....do.....	....Do.
Red— <i>Trifolium pratense</i>	B, T, S.....	20	4	17	See par. (b)(11); photos 24B3, 24B4.....	....Do.
Rose— <i>Trifolium hirtum</i>	B, T.....	20	4	110	See par. (b)(11).....	....Do.
Small hop (Suckling)— <i>Trifolium dubium</i>	B, T.....	20	4	114	....do.....	....Do.
Strawberry— <i>Trifolium fragiferum</i>	B, T.....	20	3	17	....do.....	....Do.
Sub— <i>Trifolium subterraneum</i>	B, T.....	20	4	114	....do.....	....Do.
White— <i>Trifolium repens</i>	B, T, S.....	20	3	17	....do.....	....Do.
Corn:						
Field— <i>Zea mays</i>	B, T, S, TC.....	20-30; 25	4	7	Photos 2510, 2511, 2512, 2514.....	
Pop— <i>Zea mays</i>	B, T, S, TC.....	20-30; 25	4	7		
Cotton— <i>Gossypium</i> spp.....	B, T, S.....	20-30; 30	4	112	Photos 19553, 19554.....	Test by alternate method; see par. (b)(5).
Cowpeo— <i>Vigna unguiculata</i> subsp. <i>unguiculata</i>	B, T, S.....	20-30	5	18	Photos 1989, 1990, 2377.....	
Crombe— <i>Crombe abyssinica</i>	T.....	25	3	7		
Crested dogtail— <i>Cynodon cristatus</i>	P.....	20-30	10	21	Light.....	Prechill for 3 days at 5° or 10° C.

Table 2—Germination Requirements for Indicated Kinds—Continued

Name of seed	Substrata	Temperature (°C)	First count (Dys)	Final count (Days)	Additional directions	
					Specific requirements and photo numbers	
Cratalaria:						
Lance— <i>Cratalaria lanceolata</i>	B, T, S.....	20-30	4	10		
Showy— <i>Cratalaria speciosissima</i>	B, T, S.....	20-30	4	10	Photos 2496, 2497	
Slenderleaf— <i>Cratalaria brevidens</i> var. <i>intermedia</i>	B, T, S.....	20-30	4	10		
Striped— <i>Cratalaria striata</i>	B, T, S.....	20-30	4	10		
Sunn— <i>Cratalaria juncea</i>	B, T, S.....	20-30	4	10		
Crownvetch— <i>Caranilla varia</i>	B, T, S.....	20	7	14		
Dallisgrass— <i>Paspalum dilatatum</i>	P.....	20-35	7	21	Light; KNO ₃	
Dichondra— <i>Dichondra repens</i>	B, T.....	20-30	7	28		
Dropseed, sand— <i>Sparaxis cryptandrus</i>	P.....	5-35; 15-35	5	28	.....do	
Emmer— <i>Triticum dicoccum</i>	B, T, S.....	20; 15	4	7	Photos 2507, 2520-2522	
Fescue:						
Chewings— <i>Festuca rubra</i> subsp. <i>commutata</i>	P.....	15-25	7	21	Light and KNO ₃ optional	
Hard— <i>Festuca longifolia</i>	P.....	15-25	7	21	.....do	
Hair— <i>Festuca tenuifolia</i>	P.....	10-25	10	28	KNO ₃	
Meadow— <i>Festuca pratensis</i>	P.....	15-25; 20-30	5	14	Light and KNO ₃ optional	
Red— <i>Festuca rubra</i> subsp. <i>rubra</i>	P.....	15-25	7	21	Light and KNO ₃ optional	
Sheep— <i>Festuca avina</i> var. <i>avina</i>	P.....	15-25	7	21	.....da	
Tall— <i>Festuca arundinacea</i>	P.....	15-25; 20-30	5	14	Light and KNO ₃ optional	
Flax— <i>Linum usitatissimum</i>	B, T, S.....	20-30	3	7	Photos 2003, 2008, 2485, 2487	
Gram:						
Blue— <i>Bautelava gracilis</i>	P, TB.....	20-30	7	28	Light	
Side-oats— <i>Bautelava curtipendula</i>	P.....	15-30	7	28	Light; KNO ₃	
Guar— <i>Cyamopsis tetragonala</i>	B, T, S.....	30; 20-30	5	14		
Guineagrass— <i>Panicum maximum</i>	P.....	15-35	10	28	Light; KNO ₃ optional	
Hardinggrass— <i>Phalaris tuberosa</i> var. <i>stenoptera</i>	P.....	10-30	7	28	Light	
Hardinggrass (alternate method).....	P.....	15-25	7	14	Light; KNO ₃ presoak at 15° C for 24 hours	
Hemp— <i>Cannabis sativa</i>	B, T.....	20-30	3	7		
Indiangrass, yellow— <i>Sorghastrum nutans</i>	P, TS.....	20-30	7	28	Light; KNO ₃	
Indiga, hairy— <i>Indigofera hirsuta</i>	B, T.....	20-30	5	14		
Japanese lawnglass— <i>Zoysia japonica</i>	P.....	35-20	10	28	Light	
Johnsongrass— <i>Sorghum halepense</i>	P.....	20-35	7	35	Light	
Kudzu— <i>Pueraria lobata</i>	B, T.....	20-30	5	14		
Lentil— <i>Lens culinaris</i>	B, T.....	20	5	10		
Lespedeza:						
Korean— <i>Lespedeza stipulacea</i>	B, T, S.....	20-35	5	14		
Sericea or Chinese— <i>Lespedeza cuneata</i> (L. <i>sericea</i>).....	B, T, S.....	20-35	7	21	Photo 2494	
Siberian— <i>Lespedeza juncea</i>	B, T, S.....	20-35	7	21		
Striate (Common, Kobe, Tenn. 76)— <i>Lespedeza striata</i>	B, T, S.....	20-35	7	14		
Lovgrass, sand— <i>Eragrostis trichodes</i>	P.....	20-30	5	14	Light, KNO ₃	
Lovgrass, weeping— <i>Eragrostis curvula</i>	P.....	20-35	5	14	Light	
Lupine:						
Blue— <i>Lupinus angustifolius</i>	B, T, S.....	20	4	10	Photos 14535-14542	
White— <i>Lupinus albus</i>	B, T.....	20	3	10		
Yellow— <i>Lupinus luteus</i>	B, T.....	20	7	10		
Manilagrass— <i>Zoysia matrella</i>	P.....	35-20	10	28	Light; KNO ₃	
Meadow foxtail— <i>Alapheurus pratensis</i>	P.....	20-30	7	14	Light	
Medick, black— <i>Medicago lupulina</i>	B, T, S.....	20	4	17	See par. (b)(11)	
Milkvetch— <i>Astragalus cicer</i>	B, T.....	20	6	14		
Millet:						
Browntop— <i>Bracharia ramosa</i>	B, P, T.....	20-30; 30	4	14	Light and KNO ₃ optional	
Alternate Method	B, P, T.....	5-35	4	14	Light; KNO ₃	
Foxtail—Such as Common, White Wonder, German, Hungarian, Siberian, or Golden— <i>Setaria italica</i>	B, T.....	15-30, 20-30	4	10		
Japanese— <i>Echinachla crusgalli</i> var. <i>frumentacea</i>	B, T.....	20-30	4	10		
Pearl— <i>Pennisetum americanum</i>	B, T.....	20-30	3	7		
Proso— <i>Panicum milletaceum</i>	B, T.....	20-30	3	7		
Malassasgrass— <i>Melinis minutiflora</i>	P.....	20-30	7	21	Light	
Mustard—						
Black— <i>Brassica nigra</i>	P.....	20-30	3	7	.....do	
India— <i>Brassica juncea</i>	P.....	20-30	3	7	.....do	
White— <i>Sinapis alba</i>	P.....	20-30	3	5	.....do	
Napiergrass— <i>Pennisetum purpureum</i>	B, T.....	20-30	3	10		
Oat— <i>Avena</i> spp.....	B, T, S.....	20; 15	5	10	Photos 2407, 2408, 2524-2527, 19545, 19546	
Oatgrass, tall— <i>Arrhenatherum elatius</i>	P.....	20-30	6	14	Light	
Orchardgrass— <i>Dactylis glomerata</i>	P, TS.....	15-25	7	21	Light; germination more rapid on soil	
Panicgrass, blue— <i>Panicum antidotale</i>	P, TS.....	20-30	7	28	Light	
Panicgrass, green— <i>Panicum maximum</i> var. <i>trichoglume</i>	P.....	15-35	10	28	Light; KNO ₃ optional	
Peanut— <i>Arachis hypogaea</i>	B, T, S.....	20-30; 25	5	10	Remove shells; photos 19541, 19542	
Pea, field— <i>Pisum sativum</i> var. <i>arvense</i>	B, T, S.....	20	3	18	Photos 2503, 2506, 14543-14547	
Rape:						
Annual— <i>Brassica napus</i> var. <i>annua</i>	B, T.....	20-30	3	7		
Bird— <i>Brassica rapa</i>	P.....	20-30	3	10	Light	
Turnip— <i>Brassica rapa</i>	B, T.....	20-30	3	7		
Winter— <i>Brassica napus</i> var. <i>biennis</i>	B, T.....	20-30	3	7		
Redtop— <i>Agrastis gigantea</i>	P, TB.....	20-30	5	10	Light	

Table 2—Germination Requirements for Indicated Kinds—Continued

Name of seed	Substrata	Temperature (°C)	First count (Days)	Final count (Days)	Additional directions	
					Specific requirements and photo numbers	
Rescuegrass— <i>Bromus unioloides</i>	P, S.....	10-30	7	28	Light; see par. (b)(8) for alternate method	In soil at 15° C.
Rhodesgrass— <i>Chloris gayana</i>	P.....	20-30	6	14	Light; KNO ₃	Presoak, see par. (b)(9).
Rice— <i>Oryza sativa</i>	T, S.....	20-30; 30	5	14	Photos 19549, 19550; see par. (b)(9) for alternate method..	
Ricegrass, Indian— <i>Oryzopsis hymenoides</i>	P.....	15	7	42	.....	Prechill at 5° C. for 4 weeks and test for 21 additional days. See Dormant seeds—§ 201.57a.
Alternate method.....	S.....	5-15; 15; 15-25	7	28	.....	Dark; prechill in soil at 5° C. for 4 weeks.
Roughpea— <i>Lotus hirsutus</i>	B, T.....	20	7	114	.....	Prechill at 5° or 10° C. for 5 days or predry.
Rye— <i>Secale cereale</i>	B, T, S.....	20; 15	4	7	Photos 2403, 2406, 2528-2531	
Ryegrass:						
Annual (Italian)— <i>Lolium multiflorum</i>	P, TB	15-25	5	14	Light optional; see par. (b)(10) for fluorescence test..	Light; KNO ₃ ; prechill at 5° or 10° C. for 5 days and test at 15-25° C.; if the seeds are still dormant rechill for 3 days and continue the test at 15°-25°C. an additional 4 days.
Perennial— <i>Lolium perenne</i>	P, TB	15-25	5	14	.....do .....	.....do.
Wimmera— <i>Lolium rigidum</i>	P, TB	15-25; 20-30	5	14	.....do .....	.....do.
Safflower— <i>Carthamus tinctorius</i>	P, B, T, S	15; 20	4	14	Light at 15° C.	Prechill 5 C. for 7 days.
Sainfoin— <i>Onobrychis vicifolia</i>	B, T	20-30	4	114	.....
Saltbush, fowring— <i>Atriplex canescens</i>	B	20	5	14	See par. (b)(13).....	
Sesame— <i>Sesamum indicum</i>	B, T, TB	20-30	3	6	.....
Sesbania— <i>Sesbania exaltata</i>	B, T	20-30	5	17	.....
Smilo— <i>Oryzopsis miliocea</i>	P	20-30	7	42	Light.....	Prechill at 5° C. for 2 weeks. See Dormant seeds—§ 201.57a.
Sorghum:						
Grain and Sweet— <i>Sorghum bicolor</i>	B, T, S	20-30	4	10	Photos 2413-2416.....	Prechill grain varieties at 5° or 10° C. for 5 days; test sweet varieties at 30-45° C., maintaining 45° C. for 2-4 hours per day.
Sorghum alnum— <i>Sorghum alnum</i>	T, S	20-35; 15-35	5	21	.....	Prechill at 5° C. for 5 days. Upon the 10th day of test, clip or pierce the distal end of ungerminated seeds.
Sorghum-sudangrass <i>S. bicolor</i> × <i>S. sudanense</i>	B, T, S.....	20-30	4	10	.....	Prechill at 5° C. or 10° C. for 5 days.
Sorghass ³	B, T, S.....	15-35; 20-35	5	21	Photos 2413-2416.....	Prechill at 5° or 10° C. for 7 days.
Sourclover— <i>Melilotus indica</i>	B, T	20	3	114	See paragraph (b)(11).....	
Saybean— <i>Glycine max</i>	B, T, S, TC	20-30; 25	5	18	Photos 2371, 2372, 2378.....	Prechill at 5° or 10° C. for 5 days, or predry.
Spelt— <i>Triticum spelta</i>	B, T, S	20; 15	4	7	Photos 2507; 2520-2522	Prechill at 10° C. for 5 days.
Sudangrass— <i>Sorghum sudanense</i>	B, T, S	20-30; 15-30	4	10	Photos 2449-2452.....	
Sunflower (Cult.)— <i>Helianthus annuus</i>	T, B	20-30	3	7	.....
Sweetclover:						
White— <i>Melilotus albus</i>	B, T, S	20	4	17	Photos 2374, 2375, 2376, 2381; see par. (b)(11).....	Prechill at 5° C. for 2 weeks. See Dormant seeds—§ 201.57a.
Yellow— <i>Melilotus officinalis</i>	B, T, S	20	4	do	.....	KNO ₃ and prechill at 5° or 10° C. for 5 days.
Sweet vernalgrass— <i>Anthoxanthum odoratum</i>	P	20-30	6	14	Light.....	KNO ₃ and Prechill at 5° or 10° C. for 5 days.
Switchgrass— <i>Panicum virgatum</i>	P, TS	15-30	7	28	Light; KNO ₃	
Timothy— <i>Phleum pratense</i>	P, TB	15-25; 20-30	5	10	Light; photo 2399; see par. (a)(9)	Prechill 5 days at 5° or 10° C. or predry.
Timothy, turf— <i>Phleum nodosum</i>	P, TB	15-25; 20-30	5	10	Light.....	KNO ₃ .
Tabacco— <i>Nicotiana tobacum</i>	P, TB	20-30	7	14	Light.....	See Dormant seeds—§ 201.57a.
Trefoil:						
Big— <i>Lotus uliginosus</i> (<i>L. major</i>)	B, T	20	5	12	.....
Birdsfoot— <i>Lotus corniculatus</i>	B, T	20	5	12	Photos 19531, 19532	
Triticale— <i>Triticosecale</i>	B, T, S	20; 15	4	7	.....
Vaseygrass— <i>Paspalum urvillei</i>	P	20-35	7	21	Light.....	
Yeldgrass— <i>Ehrharta colycina</i>	P	10-30	7	28	.....do	
Velvetbean— <i>Mucuna deeringiana</i>	B, T, S, C	20-30	3	14	Photos 19539, 19540	
Velvetgrass— <i>Holcus lanatus</i>	P	20-30	6	14	Light.....	
Vetch:						
Common— <i>Vicia sativa</i> subsp. <i>sativa</i>	B, T	20	5	110	.....
Hairy— <i>Vicia villosa</i>	B, T	20	5	114	.....
Hungarian— <i>Vicia pononico</i>	B, T	20	5	110	.....
Manantha— <i>Vicia articulata</i> (<i>V. monantha</i>)	B, T	20	5	110	.....
Narrowleaf— <i>Vicia sativa</i> subsp. <i>nigra</i>	B, T	20	5	114	.....
Purple— <i>Vicia benghalensis</i>	B, T	20	5	110	.....
Waalypad— <i>Vicia dosycarpa</i>	B, T	20	5	114	.....
Wheat:						
Common— <i>Triticum aestivum</i>	B, T, S	20; 15	4	7	Photos 2507, 2520-2522	Prechill at 5° or 10° C. for 5 days, or predry.
Club— <i>Triticum compactum</i>	B, T, S	20; 15	4	7	.....do .....	.....Do.
Durum— <i>Triticum durum</i>	B, T, S	20; 15	4	10	.....do .....	.....Do.
Palish— <i>Triticum palanicum</i>	B, T, S	20; 15	4	7	.....do .....	.....Do.
Poulard— <i>Triticum turgidum</i>	B, T, S	20; 15	4	7	.....do .....	.....Do.
Wheat × <i>Agrotriticum</i> - <i>Triticum</i> × <i>Agrotriticum</i>	B, T, S	20; 15	4	7	.....do .....	.....Do.
Wheatgrass:						
Beardless— <i>Agropyron spicatum</i> f. <i>inerme</i>	P, TB	15-25	7	14	Light and KNO ₃ optional	KNO ₃ and prechill at 5° C. or 10° C. for 7 days.
Fairway crested— <i>Agropyron cristatum</i>	P, TB	15-25; 20-30	5	14	.....do .....	.....Do.
Standard crested— <i>Agropyron desertorum</i>	P, TB	15-25; 20-30	5	14	.....do .....	.....Do.
Intermediate— <i>Agropyron intermedium</i>	P	15-25	5	28	.....do .....	.....Do.
Pubescent— <i>Agropyron intermedium</i> var. <i>trichopharum</i>	P	15-25	5	28	.....do .....	.....Do.
Alternate method.....	P	20-30	5	28	Light.....	.....Do.
Siberian— <i>Agropyron sibiricum</i>	P, TB	15-25	7	14	.....do .....	.....Do.
Slender— <i>Agropyron trachycolumn</i>	P, TB	15-25; 10-30	5	14	.....do	Prechill at 5° or 10° C. for 5 days. If still dormant on 10th day, rechill 2 days.
Streambank— <i>Agropyron riparium</i>	P, TB	15-25	5	14	.....do	Prechill at 5° or 10° for 5 days.
Tall— <i>Agropyron elongatum</i>	P	15-25	5	21	.....do .....	.....Do.
Alternate method.....	P	20-30	5	21	Light.....	.....Do.
Western— <i>Agropyron smithii</i>	B, T	15-30; 10-30	7	28	.....	KNO ₃ , or soil. See Dormant seeds—§ 201.57a.
Wildrye:						
Canada— <i>Elymus canadensis</i>	P	15-30	7	21	Light	Prechill at 5° C. for 2 weeks.

Table 2—Germination Requirements for Indicated Kinds—Continued

Name of seed	Substrato	Temperoture (°C)	First count (Days)	Final count (Days)	Additional directions	
					Specific requirements and phata numbers	
Russion— <i>Elymus juncea</i>	P.....	20-30	5	14	.....do	Prechill at 5° or 10° C. for 5 days.
VEGETABLE SEED						
Artichake— <i>Cynara scolymus</i>	B, T.....	20-30	7	21	Phatas 19533, 19534	
Asporagus— <i>Asparagus officinalis</i>	B, T, S.....	20-30	7	21	.....
Asparagusbeneon— <i>Vigna unguiculata subsp. sesquipedalis</i>	B, T, S.....	20-30	5	18	.....
Beon:						
Garden— <i>Phasealus vulgaris</i>	B, T, S.....	20-30; 25	5	18	Phatas 1834, 1835, 1846, 1854, 1855, see, par. 201.58 (b)(12).	
Lima— <i>Phasealus lunatus</i>	B, T, C, S.....	20-30	5	19	Phatas 2380, 2400, 2401	
Runner— <i>Phasealus coccineus</i>	B, T, S.....	20-30	5	19	.....
Beet— <i>Beta vulgaris</i> var. <i>vulgaris</i>	B, T, S.....	20-30	3	14	See par. (b)(3); photos 19557, 19558	
Broadbean— <i>Vicia faba</i>	S, C.....	20	4	14	See par. (b)(11)	
Braccali— <i>Brassica aleracea</i> var. <i>batrytis</i>	B, P, T.....	20-30	3	10	.....
Burdock, great— <i>Arctium lappa</i>	B, T.....	20-30	7	14	.....
Brussels sprouts— <i>Brassica aleracea</i> var. <i>gemmifera</i>	B, P, T.....	20-30	3	10	.....	Prechill at 5° or 10° C. for 3 days; KNO ₃ and light.
Cabbage— <i>Brassica aleracea</i> var. <i>capitata</i>	B, P, T.....	20-30	3	10	Phatas 19551, 19552 .....	.....Da.
Cabbage, Chinese— <i>Brassica pekinensis</i>	B, T.....	20-30	3	7	.....	.....Da.
Cabbage, tranchudo— <i>Brassica aleracea</i> var. <i>tronchuda</i>	B, P.....	20-30	3	10	Phatas 19551, 19552 .....	.....Da.
Cardaon— <i>Cynara cardunculus</i>	B, T.....	20-30	7	21	Phatas 19547, 19548	
Corrat— <i>Daucus carota</i>	B, T.....	20-30	6	21	Photo 19561	
Cauliflower— <i>Brassica aleracea</i> var. <i>batrytis</i>	B, P, T.....	20-30	3	10	.....	Prechill at 5° or 10° C. for 3 days; KNO ₃ and light.
Celeriac— <i>Apium graveolens</i> var. <i>rapaceum</i>	P.....	15-25; 20	10	21	Light; see par. (o)(9)	
Celery— <i>Apium graveolens</i> var. <i>dulce</i>	P.....	15-25; 20	10	21	.....do	
Chord, Swiss— <i>Beta vulgaris</i> var. <i>cicla</i>	B, T, S.....	20-30	3	14	See par. (b)(3)	
Chicory— <i>Cichorium intybus</i>	P, TS.....	20-30	5	14	Light; KNO ₃ or soil; photo 2504 see par. (o)(9)	
Chives— <i>Allium schaenoprasum</i>	B, T.....	20	6	14	.....
Citron— <i>Citrullus lanatus</i> var. <i>citroides</i>	B, T.....	20-30	7	14	Sook seeds 6 hours	Test at 30° C.
Collards— <i>Brassica aleracea</i> var. <i>acephala</i>	B, P, T.....	20-30	3	10	.....	Prechill at 5° or 10° C. for 3 days; KNO ₃ and light.
Corn, sweet— <i>Zea mays</i>	B, T, S, TC.....	20-30; 25	4	7	Phatas 2510-2512, 2514	Test at 10°
Cornsalad (Fetticus)— <i>Valerianella lacusta</i>	B, T.....	15	7	28	.....
Cowpea— <i>Vigna unguiculata</i> subsp. <i>unguiculata</i>	B, T, S.....	20-30	5	18	Phatas 1989, 1990, 2377	
Crambe— <i>Crambe abyssinica</i>	T.....	25	3	7	.....
Cress:						
Gorden— <i>Lepidium sativum</i>	B, P, T.....	15	4	10	.....
Upland— <i>Barbarea verna</i>	P, TB.....	20-35	4	7	Light; KNO ₃	
Water— <i>Nasturtium officinale</i>	P.....	20-30	4	14	Light	
Cucumber— <i>Cucumis sativus</i>	B, T, S.....	20-30	3	7	Keep substratum on dry side; see par. (o)(3); photos 19535, 19536	
Dondelian— <i>Taraxacum officinale</i>	P, TB.....	20-30	7	21	Light; see par. (o)(9)	
Eggplant— <i>Solanum melangena</i>	P, TB, RB.....	20-30	7	14	.....
Endive— <i>Cichorium endivia</i>	P, TS.....	20-30	5	14	Light; KNO ₃ or soil	
Gherkin, West India— <i>Cucumis anguria</i>	B, T, S.....	20-30	3	7	.....	Test at 30° C.
Kale— <i>Brassica aleracea</i> var. <i>acephala</i>	B, P, T.....	20-30	3	10	.....	Prechill at 5° or 10° C. for 3 doys, KNO ₃ and light.
Kale Chinese— <i>Brassica aleracea</i> var. <i>albaglabra</i>	B, P, T.....	20-30	3	.....	Light; KNO ₃ ; prechill at 5° or 10° C. for 3 days..	
Kale, Siberian— <i>Brassica napus</i> var. <i>pabularia</i>	B.....	20-30	3	7	.....
Kahrabi— <i>Brassica aleracea</i> var. <i>gangylades</i>	B, P, T.....	20-30	3	10	.....	Prechill at 5° or 10° C. for 3 days; KNO ₃ and light.
Leek— <i>Allium ampeloprasum</i>	B, T.....	20	6	14	.....
Lettuce— <i>Lactuca sativa</i>	P.....	20	None	7	Light [par. (b)(7)]	Prechill at 10° C. for 3 doys or test at 15° C.
Muskmelan (cantaloupe)— <i>Cucumis melo</i>	B, T, S.....	20-30	4	10	Keep substratum on dry side [par. (o)(3)]	
Mustard, India— <i>Brassica juncea</i>	P.....	20-30	3	7	Light	Prechill at 10° C. for 7 doys and test for 5 additional doys; KNO ₃ .
Mustard, spinach— <i>Brassica perviridis</i>	B, T.....	20-30	3	7	.....
Okra— <i>Abelmoschus esculentus</i> (<i>hibiscus esculentus</i>).....	B, T.....	20-30	4	14	Phatas 19543, 19544	
Onion— <i>Allium cepa</i>	B, T.....	20	6	10	Phatas 1962, 2253, 2254, 2328, 2330, 2340, 2341, 2469	
(Alternate method).....	S.....	20	6	12	.....
Onion, Welsh— <i>Allium fistulosum</i>	B, T.....	20	6	10	.....
Pak-chai— <i>Brassica chinensis</i>	B, T.....	20-30	3	7	.....
Parsley— <i>Petroselinum crispum</i>	B, T, TS.....	20-30	11	28	.....
Parsnip— <i>Pastinaca sativa</i>	B, T, TS.....	20-30	6	28	.....
Pea— <i>Pisum sativum</i>	B, T, S.....	20	5	18	Photos 2492, 2498-2500	
Pepper— <i>Capsicum</i> spp.....	TB, RB, T.....	20-30	6	14	.....	Light and KNO ₃ .
Pumpkin— <i>Cucurbita pepo</i>	B, T, S.....	20-30	4	7	Keep substratum on dry side [par. (o)(3)]	
Rodish— <i>Raphanus sativus</i>	B, T.....	20	4	6	Phatas 2554, 19555, 19556	
Rhubarb— <i>Rheum rhabanticum</i>	TB, TS.....	20-30	7	21	Light	
Rutabaga— <i>Brassica napus</i> var. <i>napabrassica</i>	B, T.....	20-30	3	14	.....
Solsity— <i>Tragopogon porrifolius</i>	B, T.....	15	5	10	.....	Prechill at 10° C. for 3 doys.
Sarrel— <i>Rumex acetosa</i>	P, TB, TS.....	20-30	3	14	Light	Test at 15° C.
Saybean— <i>Glycine max</i>	B, T, S, TC.....	20-30; 25	5	18	Phatas 2371, 2372, 2378	
Spinach— <i>Spinacia aleracea</i>	TB, T.....	15; 10	7	21	Keep substratum an dry side [par. (o)(3)]	
Spinach, New Zealand— <i>Tetragonia tetragonioides</i>	TS.....	10-30	5	28	.....do	
(Alternate method).....	B, T.....	15	5	21	Remove pulp fram "seeds".	
Squash— <i>Cucurbita maxima</i> and <i>C. maxima</i>	B, T, S.....	20-30	4	7	Keep substratum on dry side [par. (o)(3)]; photo 19537, 19538	
Tamata— <i>Lycopersicon esculentum</i>	B, P, RB, T.....	20-30	5	14	Photo 2513	Light; KNO ₃ .
Tamata, husk— <i>Physalis pubescens</i>	P, TB.....	20-30	7	28	Light; KNO ₃	
Turnip— <i>Brassica rapa</i>	B, T.....	20-30	3	7	.....
Watermelon— <i>Citrullus lanatus</i>	B, T, S.....	20-30; 25	4	14	Keep substratum on dry side [par. (o)(3)]	Test at 30° C.

¹ Hard seeds often present.² Firm ungerminated seeds frequently present.³ Rhizomatous derivatives of o johnsongross × sarghum cross or o johnsongross × sudongross cross.

EXAMINATIONS IN THE ADMINISTRATION
OF THE ACT

§ 201.58a Indistinguishable seed.

When the identification of the kind, variety, or type of seed or determination that seed is hybrid is not possible by seed characteristics, identification may be based upon the seedling, growing plant, or mature plant characteristics according to such authentic information as is available.

(a) *Ryegrass*. In determining the proportions of perennial and annual or Italian ryegrass seed, 400 seeds shall be grown on filter paper and the number of fluorescent seedlings determined under ultraviolet light at the end of the germination period. The percentages of pure ryegrass seed, normal fluorescent seedlings, and normal nonfluorescent seedlings shall be determined. The percentage of normal fluorescent seedlings or normal nonfluorescent seedlings is the number of each found in the test divided by the total number of seeds in the test. The results shall be applied as follows:

(1) If the quotient obtained by dividing the number of normal fluorescent seedlings by the number of normal seedlings is greater than 75 percent, the following formula shall be used:

Percent annual or Italian ryegrass = (% fluorescent seedlings \times % pure ryegrass) / % germination

The percentage of perennial ryegrass is determined by subtracting the percentage of annual or Italian ryegrass found from the percentage of pure ryegrass.

(2) If the quotient referred to in paragraph (a)(1) of this section is 75 percent or less, the following formula shall be used:

Percent perennial ryegrass = (1.0526 \times % non-fluorescent seedlings \times % pure ryegrass) / % germination

The percentage of annual or Italian ryegrass is determined by subtracting the percentage of perennial ryegrass found from the percentage of pure ryegrass.

(3) Varieties of annual or perennial ryegrass having as a characteristic a percentage of fluorescence less than 100 percent for an annual variety or more than 5 percent for a perennial variety shall not be subjected to the formulas in paragraphs (a)(1) and (2) of this section for a determination as to kind. Varieties in commercial channels in the United States which are not subjected to the above formulas include but are not limited to the following:

Ariki.
Magnolia.

(b) *Sweetclover*. In determining the percentage of yellow blossom sweetclover in a mixture of yellow and white blossom sweetclover, at least 400 seeds shall be examined to determine the percentage of mottled seed. The percentage of mottled seed shall be multiplied by four and this product multiplied by the percentage of sweetclover in the sample. The product shall be construed as representing the percentage of yellow blossom sweetclover.

(c) *Wheat*. In determining the varietal purity, the phenol method may be used according to the procedure given in the Association of Official Seed Analysts, Handbook No. 28 "A Standardized Phenol Method for Testing Wheat Seed for Varietal Purity", June 1965.

[5 FR 35, Jan. 4, 1940]

§ 201.58b Origin.

The presence of incidental weed seeds, foreign matter, or any other existing circumstances shall be considered in determining the origin of seed.

[5 FR 35, Jan. 4, 1940. Redesignated at 20 FR 7940, Oct. 21, 1955]

§ 201.58c Detection of captan, mercury, or thiram on seed.

The bioassay method may be used according to the procedure given in Association of Official Seed Analysts, Handbook No. 26, "Microbiological Assay of Fungicide-treated Seeds", May 1964.

[38 FR 12733, May 15, 1973]

TOLERANCES

§ 201.59 Application.

Tolerances shall be recognized between the percentages or rates of occurrence found by analysis, test, or examination in the administration of the act and percentages or rates of occurrence required or stated as required by the act. Tolerances for purity percentages and germination percentages provided for in §§ 201.60 and 201.63 shall be determined from the mean of (a) the results being compared, or (b) the result found by test and the figures shown on a label, or (c) the result found by test and a standard. All other tolerances, including tolerances for pure-live seed and fluorescence, and tolerances for purity based on 10 to 1,000 seeds, seedlings, or plants shall be determined from the result or results found in the administration of the Act.

[5 FR 34, Jan. 4, 1940, as amended at 20 FR 7940, Oct. 21, 1955; 24 FR 3954, May 15, 1959; 35 FR 6108, Apr. 15, 1970]

§ 201.60 Purity percentages.

(a)(1) The tolerance for a given percentage of the purity components is the same whether for pure seed, other crop seed, weed seed, or inert matter. Wider tolerances are provided when more than 33 percent of the sample is composed of seed plus empty florets and/or empty spikelets of the following chaffy kinds: *Agropyron* spp., *Agrostis* spp., *Andropogon* spp., bermudagrass, *Bouteloua* spp., *Bromus* spp., buffalograss, buffelgrass, carpetgrass, dallisgrass, *Elymus* spp., *Festuca* spp., green panicgrass, guineagrass, Indian ricegrass, meadow foxtail, molassesgrass, orchardgrass, *Poa* spp., rhodesgrass, sweet vernalgrass, tall oatgrass, vaseygrass, veldtgrass, velvetgrass, and yellow indiangrass. The wider tolerances do not apply to seed devoid of hulls.

(2) To determine the tolerance for any purity percentage found in the administration of the act, the percentage found is averaged (i) with that claimed or shown on a label or (ii) with a specified standard. The tolerance is found from this average. If more than one test is made, all except any test obviously in error shall be averaged and the result treated as a single percentage.

(b) The tolerances found in columns C and D for the respective purity percentages shown in columns A and B of table No. 3 shall be used for (1) unmixed seed and (2) mixtures in which the particle-weight ratio is 1:1 to 1.49:1, inclusive. Tolerances for intermediate percentages not shown in table 3 shall be obtained by interpolation.

Table 3—Tolerances for Any Component of a Purity Analysis for (1) Unmixed Seed or (2) Mixed Seed in Which the Particle Weight Ratio Is 1:1 to 1.49:1, Inclusive

Average analysis (A)	(B)	Non-chaffy seeds (C)	Chaffy seeds (D)
99.95-100.00.....	0.00-0.04	0.13	0.16
99.90- 99.94.....	.05-.09	.20	.23
99.85- 99.89.....	.10-.14	.24	.29
99.80- 99.84.....	.15-.19	.28	.34
99.75- 99.79.....	.20-.24	.32	.37
99.70- 99.74.....	.25-.29	.35	.41
99.65- 99.69.....	.30-.34	.37	.45
99.60- 99.64.....	.35-.39	.40	.48
99.55- 99.59.....	.40-.44	.42	.50
99.50- 99.54.....	.45-.49	.44	.53
99.40- 99.49.....	.50-.59	.47	.57
99.30- 99.39.....	.60-.69	.51	.60
99.20- 99.29.....	.70-.79	.54	.64
99.10- 99.19.....	.80-.89	.57	.66
99.00- 99.09.....	.90-.99	.59	.70
98.75- 98.99.....	1.00-1.24	.64	.75
98.50- 98.74.....	1.25-1.49	.71	.82
98.25- 98.49.....	1.50-1.74	.76	.89
98.00- 98.24.....	1.75-1.99	.82	.95
97.75- 97.99.....	2.00-2.24	.87	1.01
97.50- 97.74.....	2.25-2.49	.92	1.07
97.25- 97.49.....	2.50-2.74	.96	1.12
97.00- 97.24.....	2.75-2.99	1.00	1.17

Table 3—Tolerances for Any Component of a Purity Analysis for (1) Unmixed Seed or (2) Mixed Seed in Which the Particle Weight Ratio Is 1: 1 to 1.49: 1, Inclusive—Continued

Average analysis (A)	(B)	Non-chaffy seeds (C)	Chaffy seeds (D)
96.50- 96.99	3.00- 3.49	1.06	1.24
96.00- 96.49	3.50- 3.99	1.14	1.34
95.50- 95.99	4.00- 4.49	1.21	1.41
95.00- 95.49	4.50- 4.99	1.27	1.49
94.00- 94.99	5.00- 5.99	1.36	1.60
93.00- 93.99	6.00- 6.99	1.47	1.73
92.00- 92.99	7.00- 7.99	1.58	1.85
91.00- 91.99	8.00- 8.99	1.67	1.96
90.00- 90.99	9.00- 9.99	1.75	2.06
88.00- 89.99	10.00- 11.99	1.87	2.19
86.00- 87.99	12.00- 13.99	2.01	2.36
84.00- 85.99	14.00- 15.99	2.14	2.51
82.00- 83.99	16.00- 17.99	2.24	2.64
80.00- 81.99	18.00- 19.99	2.35	2.76
78.00- 79.99	20.00- 21.99	2.44	2.86
76.00- 77.99	22.00- 23.99	2.52	2.96
74.00- 75.99	24.00- 25.99	2.59	3.04
72.00- 73.99	26.00- 27.99	2.65	3.12
70.00- 71.99	28.00- 29.99	2.71	3.19
65.00- 69.99	30.00- 34.99	2.80	3.29
60.00- 64.99	35.00- 39.99	2.89	3.40
50.00- 59.99	40.00- 49.99	2.96	3.48

(c) Tolerances calculated by the following formula shall be used for either chaffy or nonchaffy mixtures when the average particle-weight ratio is 1.5:1 to 20:1 and beyond:

$$T = A - 100R[(100A/R)/(B+A/R) - T_1]/[(100B)/(B+A/R) + T_1] + R[(100A/R)/(B+A/R) - T_1]$$

The symbols used in the formula are as follows:

T=tolerance being calculated.

A=percent which the weight of the component with the heavier average particle-weight is of the weight of both components.

B=percent which the weight of the component with the lighter average particle-weight is of the weight of both components.

H=average particle-weight for the component with the heavier average particle-weight.

L=average particle-weight for the component with the lighter average particle-weight.

R=ratio of the average particle-weight for the component with the heavier average particle-weight to the average particle-weight for the component with the lighter average particle-weight. $R = H/L$.

*T*₁=regular tolerance for the kind of seed (chaffy or nonchaffy) and for (100B)/(B+A/R).

In determining the values for *A* and *B* in the formula, the sample shall be regarded as composed of two parts: (1) the kind, type or variety under consid-

eration and (2) all other components. Values for *H* and *L* shall be obtained from the last column of Table 1, § 201.46, or by laboratory tests for inert matter, weed seeds, or crop seeds where such values are not obtainable from Table 1. In computing tolerances for nonchaffy kinds the values for *T*₁ are taken from column C of Table 3, and for chaffy kinds the values for *T*₁ are taken from column D of Table 3.

[26 FR 10036, Oct. 26, 1961]

§ 201.61 Fluorescence percentages in ryegrasses.

Tolerances for 400-seed fluorescence tests shall be those set forth in the following table plus one-half the regular pure-seed tolerance determined in accordance with § 201.60. When only 200 seeds of a component in a mixture are tested, an additional 2 percent shall be added to the fluorescence tolerance.

Percent found fluorescence tolerance

100	
99	1.0
98	1.6
97	2.0
96	2.3
95	2.6
94	2.9
93	3.2
92	3.4
91	3.6
90	3.8
89	4.0
88	4.1
87	4.3
86	4.5
85	4.7
84	4.8
83	4.9
82	5.0
81	5.2
80	5.3
79	5.4
78	5.5
77	5.6
76	5.7
75	5.8
74	5.8
73	5.9
72	6.0
71	6.1
70	6.2
69	6.2
68	6.3
67	6.3
66	6.4
65	6.5
64	6.5
63	6.5
62	6.6
61	6.6
60	6.7
59	6.7
58	6.8
57	6.8
56	6.8
55	6.8

[32 FR 12781, Sept. 6, 1967]

§ 201.62 Tests for determination of percentages of kind, variety, type, hybrid, or offtype.

Tolerances for tests for determination of percentages of kind, variety, type, hybrid, or offtype shall be those set forth in the following table, added to one-half the required pure seed tolerances determined in accordance with § 201.60, except that one-half the pure seed tolerance will not be applied in determining tolerances for hybrids labeled on the basis of the percentage of pure seed which is hybrid.

Table 4—Tolerances for Purity Tests, When Results Are Based on 10 to 1,000 Seeds, Seedlings, or Plants Used in a Test

Seed, seedling, or plant count percent	Number of seeds, seedlings, or plants in tests										
	10	20	30	50	75	100	150	200	400	800	1,000
100 or 0	0	0	0	0	0	0	0	0	0	0	0
98 or 2	10.3	7.3	6.0	4.6	3.8	3.3	2.7	2.3	1.6	1.2	1.0
96 or 4	14.4	10.2	8.3	6.4	5.3	4.6	3.7	3.2	2.3	1.7	1.5
94 or 6	17.5	12.4	10.1	7.8	6.4	5.5	4.5	3.9	2.9	2.1	1.9
92 or 8	20.0	14.1	11.5	8.9	7.3	6.3	5.2	4.5	3.4	2.4	2.2
90 or 10	22.1	15.7	12.8	9.9	8.1	7.0	5.7	4.9	3.8	2.8	2.4
88 or 12	24.0	17.0	13.8	10.7	8.7	7.6	6.2	5.4	4.1	3.0	2.7
86 or 14	25.7	18.1	14.7	11.4	9.3	8.1	6.6	5.7	4.5	3.2	2.9

Table 4—Tolerances for Purity Tests, When Results Are Based on 10 to 1,000 Seeds, Seedlings, or Plants Used in a Test—Continued

Seed, seedling, or plant count percent	Number of seeds, seedlings, or plants in tests										
	10	20	30	50	75	100	150	200	400	800	1,000
84 or 16.....	26.9	19.0	15.5	12.1	9.8	8.5	7.0	6.0	4.8	3.4	3.0
82 or 18.....	28.2	20.0	16.4	12.6	10.3	8.9	7.3	6.3	5.0	3.6	3.2
80 or 20.....	29.5	20.9	16.9	13.2	10.7	9.3	7.6	6.6	5.3	3.8	3.3
78 or 22.....	30.5	21.6	17.6	13.6	11.0	9.6	7.9	6.8	5.5	3.9	3.5
76 or 24.....	31.4	22.3	18.2	14.1	11.5	9.9	8.1	7.0	5.7	4.1	3.6
74 or 26.....	32.3	22.8	18.6	14.4	11.8	10.2	8.3	7.2	5.8	4.2	3.7
72 or 28.....	33.0	23.4	19.0	14.8	12.1	10.5	8.5	7.4	6.0	4.3	3.8
70 or 30.....	33.7	23.8	19.5	15.1	12.3	10.7	8.7	7.5	6.2	4.4	3.9
68 or 32.....	34.3	24.3	19.9	15.4	12.5	10.8	8.9	7.7	6.3	4.5	4.0
66 or 34.....	35.0	24.7	20.2	15.7	12.7	11.0	9.0	7.8	6.4	4.6	4.0
64 or 36.....	35.4	25.0	20.5	15.8	12.9	11.2	9.1	7.9	6.5	4.6	4.1
62 or 38.....	35.5	25.4	20.6	15.9	13.0	11.3	9.2	8.0	6.6	4.7	4.2
60 or 40.....	36.1	25.7	20.9	16.1	13.2	11.4	9.3	8.1	6.7	4.8	4.2
58 or 42.....	36.2	25.7	21.0	16.2	13.3	11.5	9.4	8.1	6.8	4.8	4.2
56 or 44.....	36.5	25.8	21.0	16.4	13.3	11.5	9.4	8.2	6.8	4.8	4.3
54 or 46.....	36.8	25.8	21.2	16.4	13.4	11.6	9.5	8.2	6.9	4.9	4.3
52 or 48.....	36.8	25.9	21.2	16.5	13.4	11.6	9.5	8.2	6.9	4.9	4.3
50.....	36.8	25.9	21.3	16.5	13.4	11.6	9.5	8.2	6.9	4.9	4.3

[32 FR 12781, Sept. 6, 1967, as amended at 33 FR 10841, July 31, 1968; 35 FR 6108, April 15, 1970]

§ 201.63 Germination.

The following tolerances are applicable to the percentage of germination and also to the sum of the germination plus the hard seed when 400 or more seeds are tested.

Mean (See § 201.59)	Tolerance
96 or over.....	5
90 or over but less than 96.....	6
80 or over but less than 90.....	7
70 or over but less than 80.....	8
60 or over but less than 70.....	9
Less than 60.....	10

When only 200 seeds of a component in a mixture are tested 2 percent shall be added to the above germination tolerances.

[15 FR 2399, Apr. 28, 1950, as amended at 20 FR 7940, Oct. 21, 1955]

§ 201.64 Pure live seed.

The tolerance for pure live seed shall be determined by applying the respective tolerances to the germination plus the hard seed and the pure seed.

[5 FR 35, Jan. 4, 1940. Redesignated at 20 FR 7940, Oct. 21, 1955]

§ 201.65 Noxious weed seeds in interstate commerce.

Tolerances for rates of occurrence of noxious weed seeds shall be recognized and shall be applied to the number of noxious weed seeds found by analysis in the quantity of seed specified for noxious weed seed determinations in §§ 201.46 and 201.52. Applicable tolerances are calculated by the formula, $Y = X + 1 + 1.96\sqrt{X}$, where X is the number labeled or represented and Y is the maximum number within tolerance. Some tolerances are listed below. Representations showing the rate of occurrence indicated in Column X will be considered within tolerance if not more than the corresponding number in Column Y are found by analysis in the administration of the Act. For numbers of seeds greater than those in the table and in case of additional or

more extensive analyses, a tolerance based on a degree of certainty of 5 percent ($P=0.05$) will be recognized.

Number labeled or represented (X)	Maximum number within tolerances (Y)	Number labeled or represented (X)	Maximum number within tolerances (Y)
0	2	16	24
1	4	17	25
2	6	18	27
3	8	19	28
4	9	20	29
5	11	21	30
6	12	22	32
7	13	23	33
8	14	24	34
9	16	25	35
10	17	26	37
11	18	27	38
12	20	28	39
13	21	29	41
14	22	30	42
15	23		

[5 FR 35, Jan. 4, 1940, as amended at 15 FR 2399, Apr. 28, 1950. Redesignated at 20 FR 7940, Oct. 21, 1955, and amended at 26 FR 10036, Oct. 26, 1961; 32 FR 12782, Sept. 6, 1967]

§ 201.66 Noxious-weed seeds in imported seed.

The tolerance applicable to the prohibition of noxious-weed seeds in imported seed shall be two seeds in the minimum amount required to be examined as shown in Table 1, § 201.46. If more than one test is made, all test results within tolerance of each other shall be averaged, and the result treated as the result found.

[32 FR 12782, Sept. 6, 1967]

CERTIFIED SEED**§ 201.67 Seed certifying agency standards and procedures.**

In order to qualify as a seed certifying agency for purposes of section 101(a)(25) of the Federal Seed Act (7 U.S.C. 1551(a)(25)) an agency must enforce standards and procedures, as conditions for its certification of seed, that meet or exceed the standards and procedures specified in §§ 201.68 through 201.78.

[38 FR 25662, Sept. 14, 1973]

§ 201.68 Eligibility requirements for certification of varieties.

The certifying agency shall require the originator, developer, or owner of the variety, or agent thereof, to make the following available when eligibility for certification is requested:

- The name of the variety.
- A statement concerning the variety's origin and the breeding procedure used in its development.
- A detailed description of the morphological, physiological, and other characteristics of the plants and seed that distinguish it from other varieties.
- Evidence supporting the identity of the variety, such as comparative yield data, insect and disease resistance, or other factors supporting the identity of the variety.
- A statement delineating the geographic area or areas of adaptation of the variety.
- A statement on the plans and procedures for the maintenance of seed classes, including the number of generations through which the variety may be multiplied.
- A description of the manner in which the variety is constituted when a particular cycle of reproduction or multiplication is specified.
- Any additional restrictions on the variety, specified by the breeder, with respect to geographic area of seed production, age of stand or other factors affecting genetic purity.
- A sample of seed representative of the variety as marketed.

[38 FR 25662, Sept. 14, 1973]

§ 201.69 Classes of certified seed.

- Classes of certified seed are as follows:
 - Breeder.
 - Foundation.
 - Registered.
 - Certified.

[38 FR 25662, Sept. 14, 1973]

§ 201.70 Limitations of generations for certified seed.

The number of generations through which a variety may be multiplied shall be limited to that specified by the originating breeder or owner and shall not exceed two generations beyond the Foundation seed class with the following exceptions which may be made with the permission of the originating or sponsoring plant breeder, institution, or his designee:

(a) Recertification of the Certified class may be permitted when no Foundation seed is being maintained.

(b) The production of an additional generation of the Certified class may be permitted on a 1-year basis only, when an emergency is declared by any official seed certifying agency stating that the Foundation and Registered seed supplies are not adequate to plant the needed Certified acreage of the variety. The additional generation of Certified seed to meet the emergency need is ineligible for recertification.

[38 FR 25662, Sept. 14, 1973; 38 FR 26800, Sept. 26, 1973, as amended at 46 FR 53639, Oct. 29, 1981]

§ 201.71 Establishing the source of all classes of certified seed.

The certifying agency shall have evidence of the class and source of seed used to plant each crop being considered for certification.

[38 FR 25662, Sept. 14, 1973]

§ 201.72 Production of all classes of certified seed.

(a) Each certifying agency shall determine that genetic purity and identity are maintained at all stages of certification including seeding, harvesting, processing, and labeling of the seed.

(b) The unit of certification shall be a clearly defined field or fields.

(c) One or more field inspections shall be made (1) previous to the time a seed crop of any class of certified seed is to be harvested, and (2) when genetic purity and identity can best be determined. The field shall be in suitable condition to permit an adequate inspection to determine genetic purity and identity.

(d) A certification sample shall be drawn in a manner approved by the certifying agency from each cleaned lot of seed eligible for certification. Evidence that any lot of seed has not

been protected from contamination which might affect genetic purity, or is not properly identified, shall be cause for possible rejection of certification.

[38 FR 25662, Sept. 14, 1973]

§ 201.73 Processors and processing of all classes of certified seed.

The following requirements must be met by processors of all classes of certified seed:

(a) Facilities shall be available to perform processing without introducing admixtures.

(b) Identity of the seed must be maintained at all times.

(c) Records of all operations relating to certification shall be complete and adequate to account for all incoming seed and final disposition of seed.

(d) Processors shall permit inspection by the certifying agency of all records pertaining to all classes of certified seed.

(e) Processors shall designate an individual who shall be responsible to the certifying agency for performing such duties as may be required by the certifying agency.

(f) Seed lots of the same variety and class may be blended and the class retained. If lots of different classes are blended, the lowest class shall be applied to the resultant blend. Such blending can only be done when authorized by the certifying agency.

[38 FR 25662, Sept. 14, 1973]

§ 201.74 Labeling of all classes of certified seed.

(a) All classes of certified seed when offered for sale shall have an official certification label affixed to each container clearly identifying the certifying agency, the lot number or other identification, the variety name (if certified as to variety) and the kind and class of seed.

(b) In the case of seed sold in bulk, the invoice or accompanying document shall identify the certifying agency, the crop kind, variety (if certified as to variety), class of seed, and the lot number or other identification.

(c) The official certification label may be printed directly on the container when an accounting of the containers is required by the certifying agency.

(d) Labels other than those printed on the containers shall be attached to containers in a manner that prevents

removal and reattachment without tampering being obvious.

[38 FR 25662, Sept. 14, 1973, as amended at 46 FR 53639, Oct. 29, 1981]

§ 201.75 Interagency certification.

Interagency certification may be accomplished by participation of more than one official certifying agency in performing the services required to certify a lot of seed.

(a) The certifying agency issuing labels for all classes of certified seed shall require the seed on which the labels are used to meet standards at least equal to the minimum genetic standards for the seed in question as specified in Table 5 of this part.

(b) Seed to be recognized for interagency certification must be received in containers carrying official certification labels, or if shipped for processing, evidence of its eligibility from another official certifying agency, together with the following information:

(1) Variety (if certified as to variety) and kind;

(2) Quantity of seed (pounds or bushels);

(3) Class of certified seed;

(4) Inspection or lot number traceable to the previous certifying agency's records.

(c) Each label used in interagency certification shall be serially numbered or carry the certification identity number and clearly identify the certifying agencies involved, and the variety (if certified as to variety), kind and class of certified seed.

[38 FR 25662, Sept. 14, 1973; 38 FR 26800, Sept. 26, 1973]

§ 201.76 Minimum land, isolation, field and seed standards.

In the following Table 5 the figures in the "Land" column indicate the number of years that must elapse between the destruction of a stand of a kind and establishment of a stand of a specified class of a variety of the same kind. The figures in the "Isolation" column indicate the distance in feet from any contaminating source. The figures in the "Field" column indicate the minimum number of plants or heads in which one plant or head of another variety is permitted. The figures in the "Seed" column indicate the maximum percentage of seed of other varieties or off-types permitted in the cleaned seed.

Table 5

Crop	Foundation				Registered				Certified			
	Land	Isolation	Field	Seed	Land	Isolation	Field	Seed	Land	Isolation	Field	Seed
<i>Alfalfa:</i>												
Nonhybrid.....	1 4	44.48 600	1,000	0.1	1 3	3.44.48 300	400	0.25	1.2 1	44.49 165	100	1.0
Hybrid.....	1 4	43.1,320	42 1,000	0.1	.....	.....	.....	.....	1.2 1	3.43.44 165	42 100	1.0
<i>Barley:</i>												
Nonhybrid.....	7 1	23 0	3,000	0.05	7 1	23 0	2,000	0.1	7 1	23 0	1,000	0.2
Hybrid.....	30 1	21.32 660	3,000	0.05	30 1	21.32 660	2,000	0.1	30 1	21.32 330	1,000	0.2

Table 5—Continued

Crop	Foundation				Registered				Certified			
	Land	Isolation	Field	Seed	Land	Isolation	Field	Seed	Land	Isolation	Field	Seed
Beans:												
Field and garden	71	230	2,000	0.05	71	230	1,000	0.1	71	230	500	0.2
Mung	71	230	2,000	0.1	71	230	1,000	0.2	71	230	500	0.5
Broodbean	71	230	2,000	0.05	71	230	1,000	0.1	71	230	500	0.2
Clover (all kinds)	195	5.18.44600	1,000	0.1	1.93	5.18.44300	400	0.25	1.92	18.44165	100	1.0
Corn:												
Bockcross	0	10.11660	13.461,000	15.0.1								
Inbred	0	10.11660	13.461,000	15.0.1								
Foundation single cross	0	10.11660	13.461,000	15.0.1								
Hybrid									0	11.12660		0.5
Open-pollinated									0	11.12660	200	0.5
Sweet									0	11.14660		0.5
Cotton	0	190	10,000	0.03	0	190	5,000	0.05	0	190	1,000	0.1
Cowpea	71	230	2,000	0.1	71	230	1,000	0.2	71	230	500	0.5
Crambe	71	660	2,000	0.05	71	24660	1,000	0.1	71	24660	500	0.25
Crownvetch	15	5.44600	1,000	0.1	13	5.44300	400	0.25	12	6.44165	100	1.0
Flotpeo	14	5.44600	1,000	0.1	13	5.44300	400	0.25	12	3.44165	100	1.0
Flax	71	230	5,000	0.05	71	230	2,000	0.1	71	230	1,000	0.2
Grasses:												
Cross-pollinated	5	4.18.20900	1,000	0.1	81	4.18.20300	100	1.0	81	4.18.20165	50	47.20
Strains at least 80 percent opomitic and highly self-fertile species	5	4.18.2060	1,000	0.1	81	4.18.2030	100	1.0	81	4.18.2015	50	16.20
Lespedeza	15	410	1,000	0.1	13	410	400	0.25	12	410	100	1.0
Millet:												
Cross-pollinated	81	401,320	2720,000	0.005	81	401,320	2710,000	0.01	81	40660	275,000	0.02
Self-pollinated	81	230	3,000	0.05	81	230	2,000	0.1	81	230	1,000	0.2
Mustard	4	1,320	2,000	0.05					2	24660	500	0.25
Oat	71	230	3,000	0.2	71	230	2,000	0.3	71	230	1,000	0.5
Okro	71	1,320	270	0.0	71	1,320	272,500	0.5	71	825	271,250	1.0
Onion	71	5,280	22200	0.0	71	2,640	22200	0.5	71	1,320	22200	22.10
Pea, field	71	230	2,000	0.05	71	230	1,000	0.1	71	230	500	0.2
Peanut	71	230	1,000	0.1	71	230	500	0.2	71	230	200	0.5
Pepper	71	25200	0	0.0	71	25100	300	0.5	71	2530	150	1.0
Rape:									2	24330	500	0.25
Cross-pollinated	4	241,320	2,000	0.05					2	24330	500	0.25
Self-pollinated	4	24660	2,000	0.05					2	24330	500	0.25
Rice	71	3910	10,000	0.05	71	3910	5,000	0.1	71	3910	1,000	0.2
Rye	71	18660	3,000	0.05	71	18660	2,000	0.1	71	18660	1,000	0.2
Safflower	72	1,320	10,000	0.01	72	1,320	2,000	0.05	72	1,320	1,000	0.1
Sainfoin	15	5.44600	1,000	0.1	13	5.44300	400	0.25	12	5.44165	100	1.0
Sorghum:												
Nonhybrid	71	990	2750,000	0.005	71	990	2735,000	0.01	71	29660	2720,000	0.05
Hybrid seedstock	71	990	2750,000	0.005					71	21.29.31660	2720,000	0.1
Commercial hybrid									71	230	200	0.5
Soybeans	331	230	1,000	0.1	331	230	500	0.2	331	230	200	0.5
Sunflower:												
Nonhybrid	1	41.452,640	200	0.02	1	41.452,640	200	0.02	1	41.452,640	200	34.0.1
Hybrid	1	41.452,640	35250	0.02					1	41.452,640	35250	34.0.1
Tomoto	71	25200	0	0	71	25100	300	0.5	71	2530	150	1.0
Tobacco:												
Nonhybrid	360	37150	0	0.01	360	37150	0	0.01	360	37150	0	0.01
Hybrid									360	38150	0	0.01
Trefoil, birdfoot	15	5.44600	1,000	0.1	13	5.44300	400	0.25	12	6.44165	100	1.0
Triticale	71	230	3,000	0.05	71	230	2,000	0.1	71	230	1,000	0.2
Vetch	1.75	17.4410	1,000	0.1	1.73	17.4410	400	0.25	1.72	17.4410	100	1.0
Vetch, milk	15	5.44600	2,000	0.05	13	5.44300	1,000	0.1	12	5.44165	200	0.5
Watermelon	71	262,640	280	0	71	262,640	280	0.5	71	261,320	28500	1.0
Wheat:												
Nonhybrid	71	230	3,000	0.05	71	230	2,000	0.1	71	230	1,000	0.2
Hybrid	301	21.32660	3,000	0.05	301	21.32660	2,000	0.1	301	21.32330	1,000	0.2

¹ The land must be free of volunteer plants of the crop kind during the year immediately prior to establishment and no manure or other contaminating material shall be applied the year previous to seeding or during the establishment and productive life of the stand.

² At least 2 years must elapse between destruction of indistinguishable varieties or varieties of dissimilar adoption and establishment of the stand for the production of the Certified class of seed.

³ Isolation distance for certified seed production shall be of least 500 feet from varieties of dissimilar adoption.

⁴ Isolation between classes of the same variety may be reduced to 25 percent of the distance otherwise required.

⁵ This distance applies when fields are 5 acres or larger in area. For smaller fields, the distances are 900 feet and 450 feet for the Foundation and Registered classes, respectively.

⁶ Fields of less than 5 acres require 330 feet.

⁷ Requirement is waived if the previous crop was grown from certified seed of the same variety.

⁸ Requirement is waived if the previous crop was of the same variety and of a certified class equal or superior to that of the crop seeded.

⁹ Reseeding varieties of crimson clover may be allowed to volunteer each year on the same ground. If a new variety is being planted where another variety once grew, the field history requirements apply.

¹⁰ No isolation is required for the production of hand-pollinated seed.

¹¹ When the contaminant is of the same color and texture, the isolation distance may be modified by (1) adequate natural barriers, or (2) differential maturity dates, provided there are no receptive silks in the seed parent at the time the contaminant is shedding pollen. In the case of inbred lines and foundation single crosses, these modifications may apply only for fertile seed production.

¹² Where the contaminating source is corn of the same color and texture as that of the field inspected, the isolation distance is 410 feet and may be modified by the planting of pollen parent border rows according to the following table:

Minimum Numbers of Border Rows Required

Minimum distance from contaminant	Field size, up to 20 acres	Field size, 20 acres or more
410	0	0
370	2	1
330	4	2
290	6	3
245	8	4
205	10	5
165	12	6
125	14	7

Minimum Numbers of Border Rows Required—Continued

Minimum distance from contaminant	Field size, up to 20 acres	Field size, 20 acres or more
85.....	16	8
0.....	(¹)	10

¹ Not permitted.¹³ Refers to off-type plants in the pollen parent that have shed pollen or to the off-type plants in the seed parent at the time of the last inspection.¹⁴ The required minimum isolation distance for sweet corn is 660 feet from the contaminating source, plus four border rows when the field to be inspected is 10 acres or less in size. This distance may be decreased by 15 feet for each increment of 4 acres in the size of the field to a maximum of 40 acres, and further decreased 40 feet for each additional border row to a maximum of 16 rows. These border rows are for pollen-shedding purposes only.¹⁵ Refers to off-type ears. Ears with off-colored or different textured kernels are limited to 0.5 percent, or a total of 25 off-colored or different textured kernels per 1,000 ears.¹⁶ The Merion variety of Kentucky bluegrass is allowed 3 percent.¹⁷ All cross-pollinating varieties must be 400 feet from any contaminating source.¹⁸ Isolation between diploids and tetraploids shall be at least 15 feet.¹⁹ Minimum isolation shall be at least 100 feet if the cotton plants in the contaminating source differ by easily observable morphological characteristics from the field to be inspected. Isolation distance between upland and Egyptian types shall be at least 1,320, 1,320, and 660 feet for Foundation, Registered, and Certified classes, respectively.²⁰ These distances apply when there is no border removal. Border removal applies only to fields of 5 acres or more. Removal of a 9-foot border (after flowering) decreases the required distance for Foundation, Registered, and Certified seed to 600, 225, and 100 feet, respectively, for cross-pollinated species, and to 30, 15, and 15 feet, respectively, for apamictic and self-pollinated species. Removal of a 15 foot border (after flowering) allows a further decrease to 450, 150, and 75 feet, respectively, for cross-pollinated species.²¹ Isolation distances between two fields of the same kind may be reduced to a distance adequate to prevent mechanical mixture, if the sum of percentages of plants in bloom in both fields does not exceed 5 percent at a time when more than 1 percent of the plants in either field are in bloom.²² Refers to bulbs.²³ Distance adequate to prevent mechanical mixture is necessary.²⁴ Required isolation between classes of the same variety is 10 feet.²⁵ The minimum distance may be reduced by 50 percent if different classes of the same variety are involved.²⁶ The minimum distance may be reduced by 50 percent if the field is adequately protected by natural or artificial barriers.²⁷ These ratios are for definite other varieties. The ratios for doubtful other varieties are:

	Foundation	Registered	Certified
Millet.....	1:10,000	1:5,000	1:2,500
Sorghum:			
Nonhybrid	1:20,000	1:10,000	1:1,000
Hybrid	1:20,000	(¹)	1:1,000
Okra	None	1:750	1:500

¹ Not applicable.²⁸ Whiteheart fruits may not exceed 1 per 100, 40 and 20 for Foundation, Registered, and Certified classes, respectively. Citran or hard rind is not permitted in Foundation or Registered classes and may not exceed 1 per 1,000 fruits in the Certified class.²⁹ This distance applies if the contaminating source does not genetically differ in height from the pollinator parent or has a different chromosome number. If the contaminating source does (genetically) differ and has the same chromosome number the distance shall be 990 feet. The minimum isolation from grass sorghum or broomcorn with the same chromosome number shall be 1,320 feet.³⁰ Requirement is waived for the production of pollinator lines if the previous crop was grown from a certified class of seed of the same variety. Sterile lines and crossing blocks must be an land free of contaminating plants.³¹ If the contaminating source is similar to the hybrid in all important characteristics, the isolation may be reduced by 66 feet for each pair of border rows of the pollinator parent down to a minimum of 330 feet. These rows must be located directly opposite or diagonally to the contaminating source. The pollinator border rows must be shedding pollen during the entire time 5 percent or more of the seed parent flowers are receptive.³² An unplanted strip at least 2 feet in width shall separate male sterile plants and pollinator plants in inter-planted blocks.³³ Unless the preceding crop was another kind or unless the preceding soybean crop was planted with a class of certified seed of the same variety, or unless the preceding soybean crop and the variety being planted are of contrasting pubescence or hilum color, in which case, no time need elapse.³⁴ May include not more than 0.04 percent purple or white seeds.³⁵ Standards apply equally to seed parents and pollen parents which may include up to 1:1,000 plants each of the wild-type branching, purple or white-seeded plants.³⁶ A new plant bed must be used each year unless the bed is properly treated with a soil sterilant prior to seeding.³⁷ This distance is applied between varieties of the same type and may be waived if four border rows of each variety are allowed to bloom and set seed between the two varieties but are not harvested for seed. Isolation between varieties of different types shall be 1,320 feet except if protected by bogging or by topping all plants in the contaminating source before bloom.³⁸ When male sterile and male fertile plants of the same type are planted adjacent in a field, this requirement may be waived; provided, four border rows of male sterile plants are allowed to bloom and set seeds. The seed from these border rows shall not be harvested as part of the certified lot of seed produced by the male sterile plants. When plants are of different types, the distance shall be 1,320 feet except if protected by bogging or by topping all plants in the contaminating source before bloom.³⁹ Isolation between varieties shall be 100 feet if aerial seeded and 50 feet if ground broadcast.⁴⁰ Isolation between millets of different genera shall be 6 feet.⁴¹ Does not apply to *Helianthus annuus*, *H. ludens*, or *H. agrestis*.⁴² The ratio of male sterile (A) strains and pollen (B or C) strains shall not exceed 2:1.⁴³ Parent lines (A and B) in a crossing block, or seed and pollen lines in a hybrid seed production field, shall be separated by at least 6 feet and shall be managed and harvested in a manner to prevent mixing.⁴⁴ Distance between fields of certified classes of the same variety may be reduced to 10 feet regardless of the class or size of the fields.⁴⁵ An isolation distance of 5,280 feet is required between oil and non-oil sunflower types and between either type and other volunteers or wild types.⁴⁶ Detasseling, cutting, or pulling of the cytoplasmic male-sterile seed parent is permitted.⁴⁷ All varieties of perennial ryegrass seed are allowed 3.0 percent.⁴⁸ This distance applies for fields over 5 acres. For alfalfa fields of 5 acres or less that produce the Foundation and Registered seed classes, the minimum distance from a different variety or a field of the same variety that does not meet the varietal purity requirements for certification shall be 900 and 450 feet, respectively.⁴⁹ There must be at least 10 feet or a distance adequate to prevent mechanical mixture between a field of another variety (or noncertified area within the same field) and the area being certified. The 165 feet isolation requirement is waived if the area of the "isolation zone" is less than 10 percent of the field eligible for the Certified class. The "isolation zone" is that area calculated by multiplying the length of the common border(s) with other varieties of alfalfa by the average width of the field (being certified) falling within the 165 feet isolation. Areas within the isolation zone nearest the contamination source shall not be certified.

[46 FR 53639, Oct. 29, 1981; 46 FR 58059, Nov. 30, 1981; 46 FR 59527, Dec. 7, 1981]

ADDITIONAL REQUIREMENTS FOR THE CERTIFICATION OF PLANT MATERIALS OF CERTAIN CROPS

§ 201.77 Length of stand requirements.

(a) *Alfalfa*. Limitations on the age of stand and certified seed classes through which a given variety may be multiplied both inside and outside its region of adaptation shall be specified by the originator or his designee. Certified seed production outside the region of adaptation shall not exceed 6 years if not otherwise specified by the originator, or his designee.

(b) *Red clover*. Only two seed crops are permitted of all certified seed classes.

(c) *White and alsike clover*. Only two successive seed crops are permitted following the year of establishment for Foundation and Registered classes, but 2 additional years are permitted if the field is reclassified to the next lower class. Four successive seed crops following seeding are permitted if the first and succeeding crops are of the Certified class, provided the stand of perennial plants is maintained.

(d) *Sainfoin*. All certified seed classes are eligible to produce five successive seed crops following seeding.

[38 FR 25664, Sept. 14, 1973]

§ 201.78 Pollen control for hybrids.

(a) *Wheat and barley*. Shedders in the seed parent, at any one inspection, are limited to 1:200 heads for Foundation A Line and 1:100 heads for Registered A Line, except that when the A Line is increased outside the area of the anticipated A x R production in order to utilize self-fertility produced by environmental effects, only isolation and genetic purity standards will be in effect. (An A Line is a cytoplasmic male sterile female line used to produce hybrid seed. An R Line is a pollinator line used to pollinate an A

Line and to restore fertility in the resulting hybrid seed.)

(b) *Corn*. When 5 percent or more of the seed parent plants have receptive silks, shedding tassels in the seed parent plants shall be limited to 1 percent at any one inspection, or a total of 2 percent at any three inspections on different dates. Shedding tassels are those which have 2 inches or more of the central stem or branches, or any combination thereof, shedding pollen.

(c) *Sorghum*. Shedders in the seed parent, at any one inspection, are limited to 1:3,000 plants for Foundation class and 1:1,500 plants for Certified class.

(d) *Sunflowers*. Seed parents flowering and shedding pollen before the male parents are shedding pollen must be removed. At least 50 percent of the male plants must be producing pollen when the seed parent is in full bloom.

(e) *Hybrid alfalfa*. When at least 75 percent of the plants are in bloom and there is no more than 15 percent seed set, 200 plants shall be examined to determine the pollen production index (PPI). Each plant is rated as 1, 2, 3 or 4 with "1" representing no pollen, "2" representing a trace of pollen, "3" representing substantially less than normal pollen, and "4" representing normal pollen. The rating is weighted as 0, 0.1, 0.6 or 1.0, respectively. The total number of plants of each rating is multiplied by the weighted rating and the values are totaled. The total is divided by the number of plants rated and multiplied by 100 to determine the PPI. The maximum PPI allowed is 14 for the Foundation class, and 6 for 95 percent hybrid seed, and 42 for 75 percent hybrid seed of the Certified class.

[38 FR 25664, Sept. 14, 1973, as amended at 41 FR 20158, May 17, 1976]

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